THE IRON AGE

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The Tod Long Cross Head Blowing Engine.

Illustrations are herewith given of a 44 and 84 and 84 by 60 inch long cross head blowing engine recently installed at the Lowellville plant of the Ohio Iron & Steel Company by the William Tod Company, Youngstown, Ohio. The engine is designed to operate at 50 revolutions per minute against a maximum working air pressure of 25 pounds when supplied with steam at a pressure of 150 pounds. Tte steam gear is of the Corliss type and the air gear is positively operated. This design of air gear is the development of a number of experiments and was used on the large steeple engines for the Ohio Steel Company, Youngstown, Ohio, in 1898. It was patented in 1895 and improvements on it were patented in 1901. Fig. 1 gives a general view of the complete engine, Fig. 2 a view of the head of the air cylinder and parts of the valves removed, Fig. 3 a drawing of the air gear with parts broken away to show the inlet and outlet valves and Fig. 4 a detail of the double ported inlet valve.

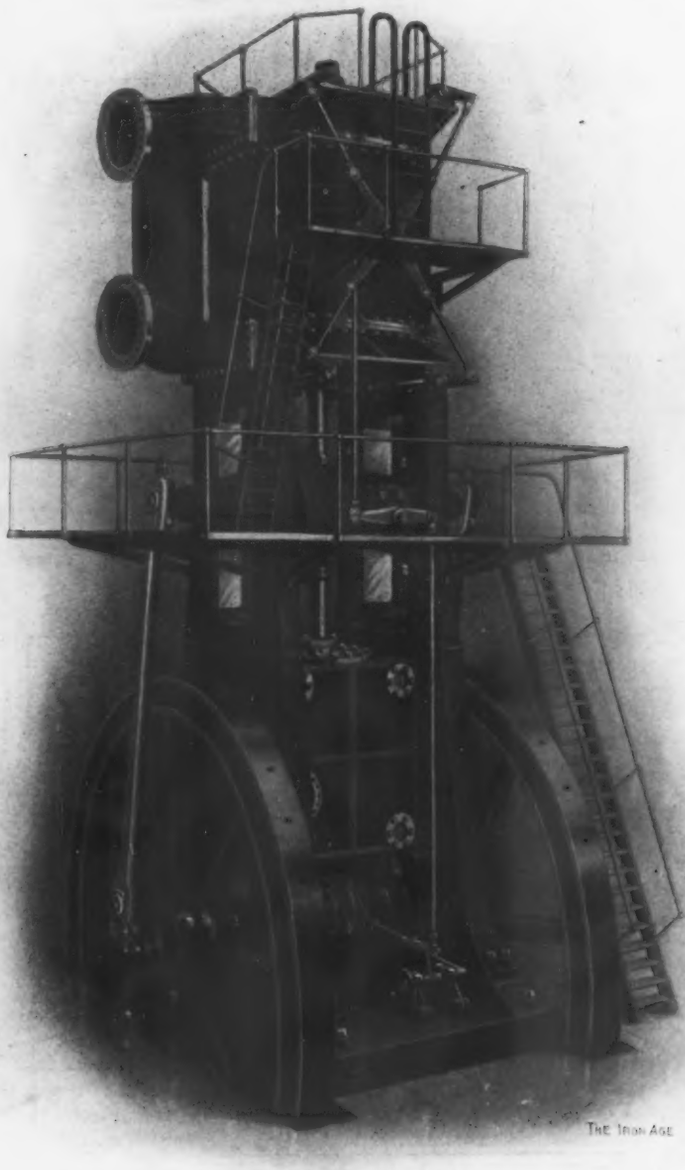


Fig. 1.—A 44 and 84 and 84 x 60 Inch Long Cross Head Blowing Engine, Built by the William Tod Company, Youngstown, Ohio.

As Fig. 3 shows, the inlet valve A consists of a balanced piston with packing rings, working in a cage set in the cylinder head casting. This cage is separate from the cylinder head, and is provided with oblique ribs, so that any uneven wear of the packing rings is prevented. The valve proper is driven from the wrist plate B, so that it opens when the air in the clearance space is expanded to atmospheric pressure and closes at or near the dead center of the crank motion. As the point at which the air in the clearance is expanded to atmospheric pressure and at which the inlet valve should open varies with the pressure against which the engine operates, the valve is connected to the driving lever by an adjustable link C, so that it may be set for the mean or average pressure against which the engine blows and may be adjusted should the conditions change. In the earlier designs this valve was a simple piston, but for higher speeds a modification has been adopted providing for double ports. This double porting, shown in Fig. 4, maintains a greater inlet opening at the latter part of the stroke and so, at high speeds, permits the cylinder to be completely filled with air without throttling it to below atmospheric pres-

sure. The outlet valve D, Fig. 3, is of the ordinary construction, and is arranged for automatic opening and positive closing, the plunger being driven so as to engage the valve proper in closing without shock or jar.

As in a Corliss design of blowing engine, the parts may be subjected to full boiler pressure and maximum air pressure for the first part of the stroke, so the pins, cross head, rods, shafts and housing are very heavy. The bed plate is of box shape, very deep under the main bearings and strongly ribbed, and has a full bearing on the founda-

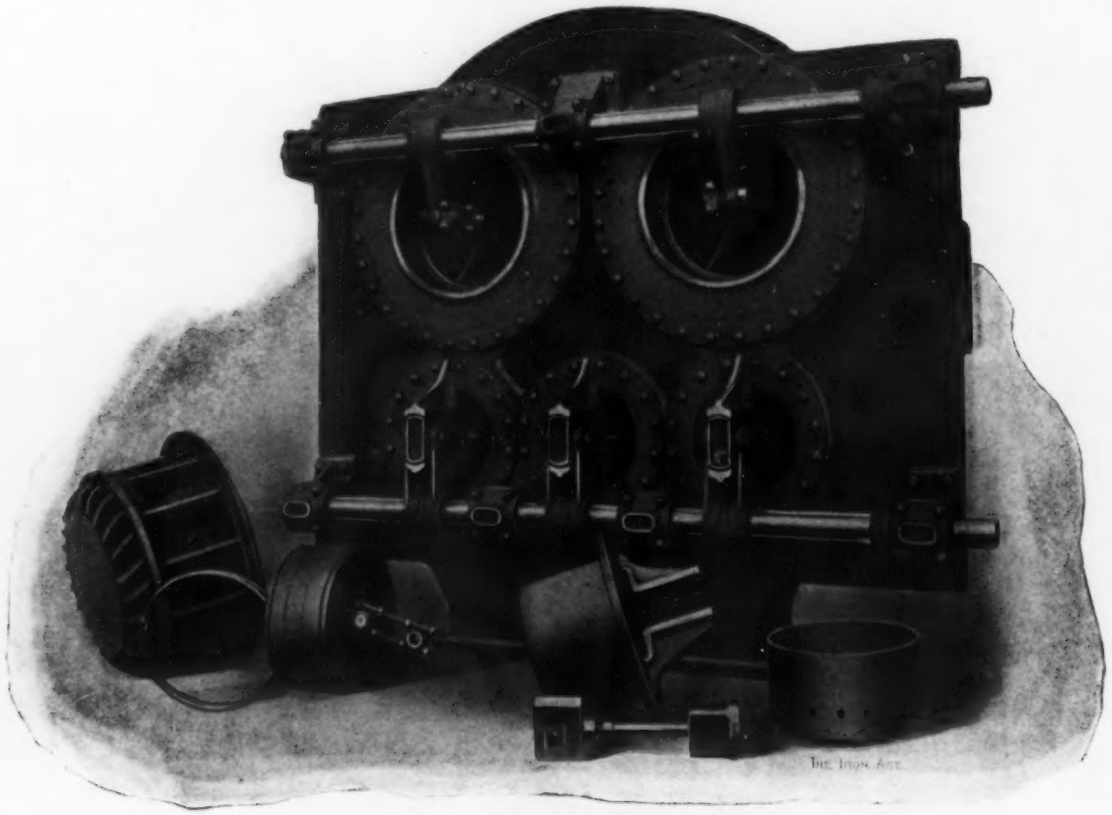


Fig. 2.—The Head of the Air Cylinder and Parts of the Inlet and Outlet Valves.

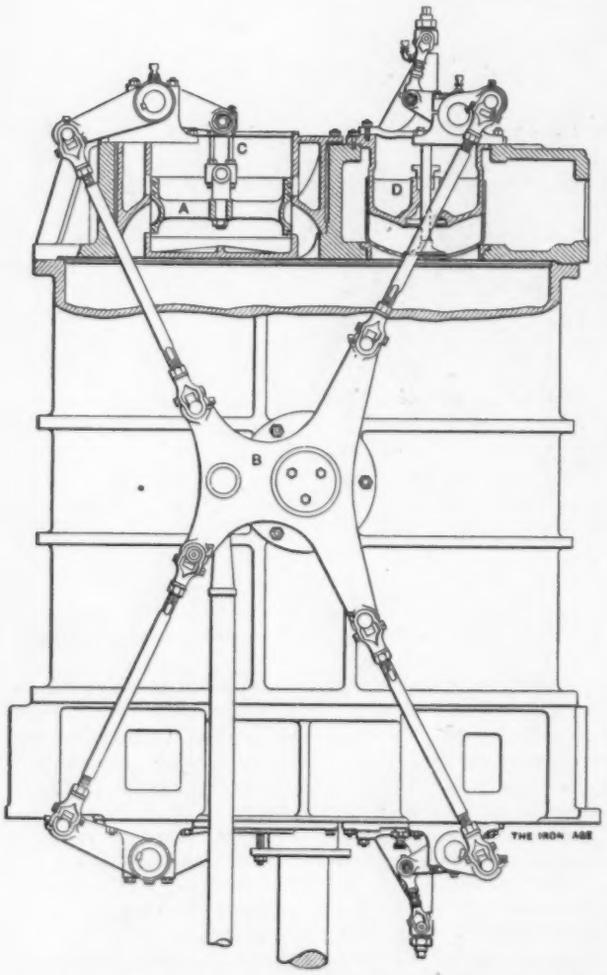


Fig. 3.—Detail of the Air Cylinder, Showing the Operation of the Valves.

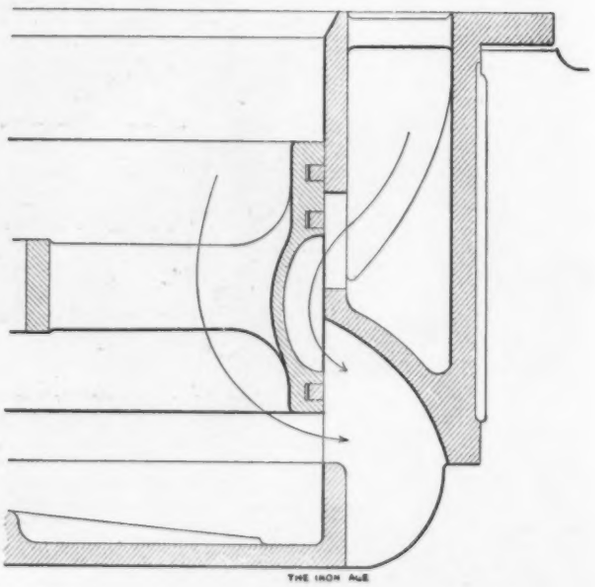


Fig. 4.—Detail of the Double Ported Inlet Valve.

tion. The housings are of cast iron and of very substantial shape. They are very much heavier than the strain alone would require to insure rigidity and freedom of vibration and are tied together by cast iron braces between the steam and air cylinders. The cross head is a steel casting 42 inches deep at the center. Before shipping it was tested in the shop by supporting it on the trunnions and applying two and one-half times the maximum working stress at the center. The two fly wheels are 19 feet in diameter and weigh 48,000 pounds each.

The engine is well provided with galleries and stairs, making all parts readily accessible, and is supplied with a complete sight feed oiling system arranged to connect with the central oiling system of the station.

Electrification of the Long Island Railroad.

BY S. D. V. BURR.

There has just been completed on the Long Island Railroad the installation of the most extensive system of electrification yet put in operation on any steam railroad in the world. The Western Division of this road consists of numerous lines within the City of New York, the main terminus of the road being in Long Island City and another very important terminus at the junction of Atlantic and Flatbush avenues. The line to the latter is four-tracked from Jamaica to East New York, thence double-tracked through Atlantic to Flatbush avenue. The traffic on this section is very heavy, as the district is almost solidly built up. By an agreement made with the city in 1897 the Railroad Company agreed to remove its tracks from the surface of Atlantic avenue and to operate its passenger trains by a motive power not requiring local combustion; this condition obviously pointed to electric traction.

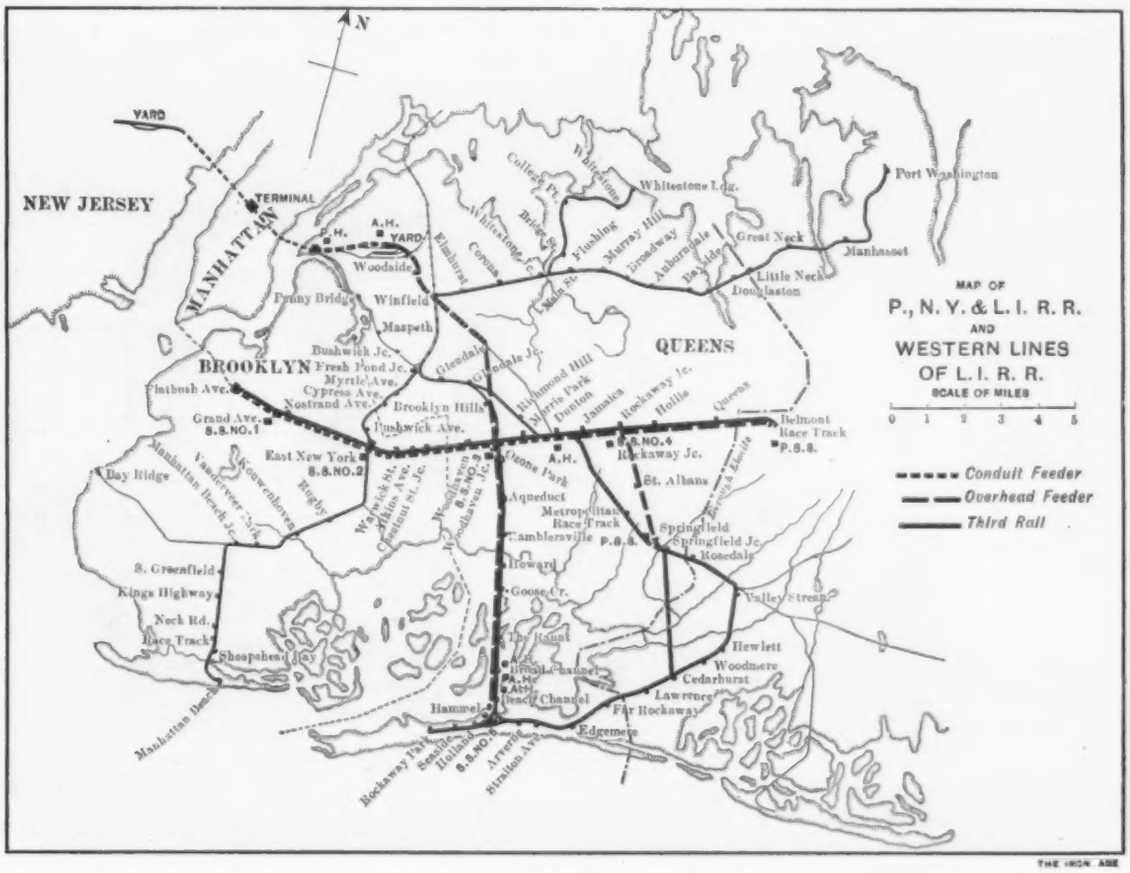


Fig. 1.—Map of the Electrified Portion of the Long Island Railroad System.

By referring to the map, Fig. 1, it will be seen that the Flatbush terminal is in the heart of the Borough of Brooklyn, and connection is made at that point with the Brooklyn Elevated roads leading to the Brooklyn Bridge and Broadway Ferry; connection will also soon be made with the Subway from the Battery, thereby providing a short and direct route to the lower business section of Manhattan. The regular local and through traffic is extensive at all times, and in certain seasons provision must be made for handling extra large excursion and race track crowds.

Extent of Electrification.

This complicated service made it impossible to adopt any plan that contemplated a combined system of steam and electric haulage, since the transfer of passengers at any point would have occasioned endless confusion and delay. It was, therefore, determined to electrify all the lines leading from the Flatbush terminal. This resulted in practically electrifying the entire road south of Atlantic avenue and the main line out to Queens and as far east on the Montauk Division as Valley Stream.

The diverse character of the train service and its very fluctuating loading at different seasons of the year introduced conditions unfavorable for economical electric traction, principally for the reason that the load factor on any of the fixed portions of the complete system would necessarily be very low throughout the year. Nevertheless, the company determined to make this heavy initial expenditure and provide a complete electric service at the outset, looking to the growth of the territory in the future for the returns.

Under normal working the loading of the power plant and substations will be comparatively light, but in order to take care of the race track and excursion movement a power capacity has been installed sufficient to operate simultaneously the following trains per hour in each direction: Flatbush avenue to Belmont Park, 15 six-car trains; Flatbush avenue to Rockaway Beach, three six-car trains; Valley Stream to Hammel's, two four-car trains. In addition to the above power is supplied to the trolley lines between Rockaway Park and Jamaica.

System Adopted.

A decision upon the character of the equipment and the nature of the electrical apparatus involved the possibilities of connecting with the lines of neighboring companies, including the Brooklyn Rapid Transit, the Interborough Rapid Transit and the Pennsylvania Railroad tunnels, as well as the physical character of the lines of the Long Island road itself. The problem, therefore, was

to harmonize the operation over elevated lines, in subways, on the surface and in tunnels. To accomplish this it was decided to adopt for the car equipment a type and dimension of car that would permit of through operation over all connecting lines. It was also decided to adopt the system of electric distribution that was standard on all the lines—namely, third-rail contact and direct current at 600 volts for use at the motors and alternating current distribution at 11,000 volts converted at substations.

The Main Power Station.

The current for the entire system will be generated at the large power house, now nearly completed, at Long Island City, a view in which is given in Fig. 2. This power house has the distinction of being the first to be equipped throughout with steam turbines. At present it is 250 x 300 feet and 120 feet high, exclusive of the stacks. It will be greatly enlarged upon the completion of the Pennsylvania tunnels. There are now three Westinghouse-Parsons turbine units of 5500 kw. capacity each,

The three-phase alternating current is carried in conduits through the built up portion of Long Island City as far as the railroad yards. From there the cables are brought overhead and carried on a specially designed latticed steel pole line. Wherever the transmission lines cross telegraph or telephone wires the latter are led underneath the high tension wires, the substantial construction of the latter precluding their breaking and falling across the telegraph wires. This pole line follows the railroad tracks to Winfield, from which place it is led across country on a special right of way to Glendale Junction, where it again follows the railroad to Woodhaven Junction. At this point the lines branch in the direction of the different substations. These, designated S S on the map, are located at Grand and Atlantic avenues, East New York, Woodhaven Junction, Rockaway Junction and Hammel's.

Substation Equipment.

All the substations are furnished with rotary converters and static transformers. The largest, at Wood

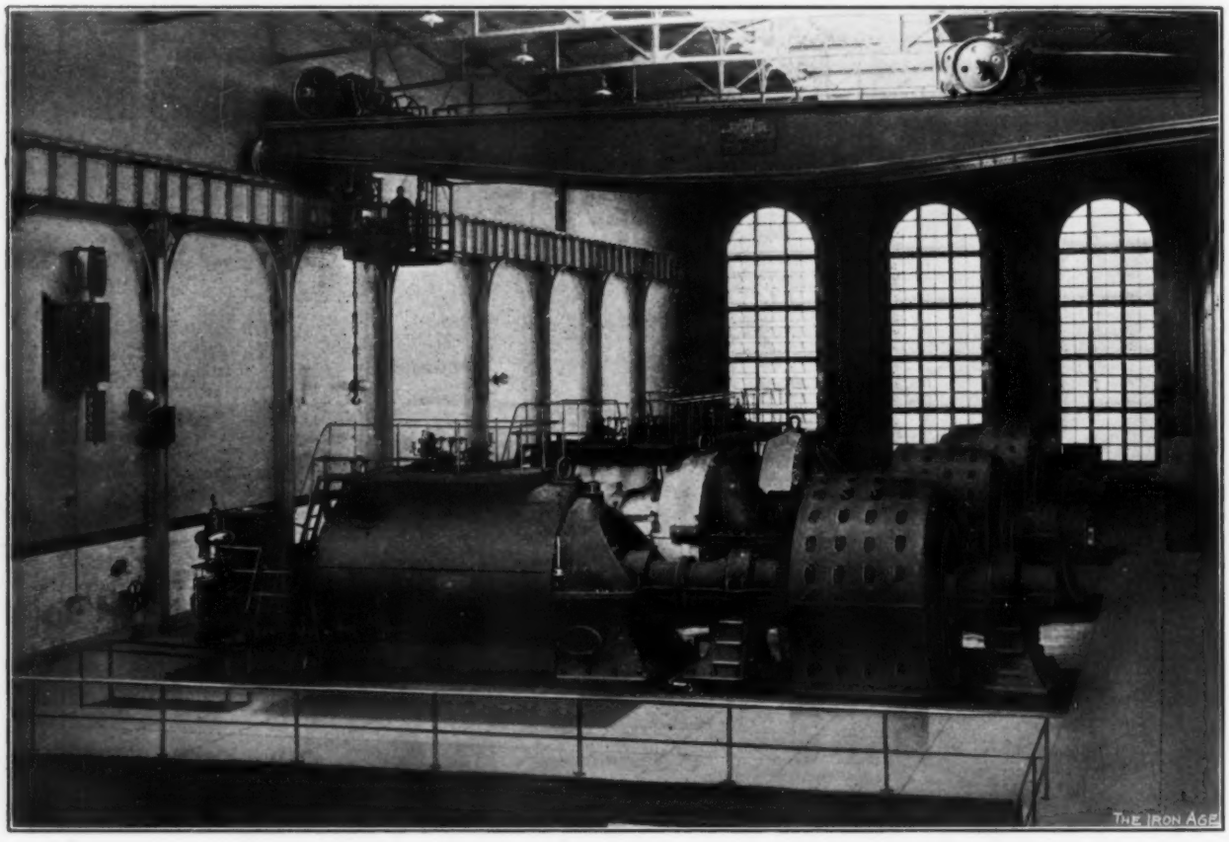


Fig. 2.—Interior of the Power House at Long Island City.

and the engine room provides facilities for three more such units. The boiler room has a double tier of 32 boilers of 520 horse-power each, and there is space for 16 more of the same size. Just above the boiler room is the coal bunker, holding 7000 tons. The coal elavator, shown in Fig. 3, is 110 feet above the river level and swings directly over the barges tied to the dock. A clamshell bucket holding 3000 pounds hoists the coal and dumps it into a hopper, from which it passes to a set of breakers. It is then cleaned, automatically weighed and dropped into small steel cars holding 3 tons each. A cable hauls the cars into the bunker, where they are automatically tripped.

From the map it will be noticed that this power house, indicated by the letters P H, is not at the center of gravity of the whole electrified system, but it must be born in mind that this system forms a part of the general scheme for the operation of the Pennsylvania Railroad terminal now building in New York and the moving of trains in the North and East River tunnels. When all these improvements shall have been finished and the Long Island Railroad entirely electrified the power house will be about at the center of distribution.

haven Junction, a view in which is given in Fig. 4, has three 1500-kw. converters and nine transformers of 550 kw. capacity. Ultimately this station will have six 1500-kw. converters and a suitable number of transformers. All the stations now equipped with 1000-kw. converters have been provided with foundations for those of 1500 kw. capacity, the idea being to substitute the latter as the demand for power increases.

The Grand avenue substation is provided with an initial equipment of three 1000-kw. rotary converters and nine static transformers of 375 kw. capacity. The ultimate capacity, however, will include four 1500-kw. converters, with a corresponding increase in transformer capacity. The Rockaway Junction station now has an equipment of two 1000-kw. converters and six transformers of 375 kw. capacity. Ultimately there will be four 1500-kw. converters and the proper number of transformers. The East New York station has an equipment of three 1000-kw. converters with nine 375-kw. transformers. The final equipment will be four 1500-kw. converters and the corresponding number of transformers.

The substation at Hammel's has two 1000-kw. converters and six 375-kw. transformers. It will finally con-

tain six 1500-kw. converters and the proper transformer capacity. In addition the Hammel's station has a storage battery of 2000 kw.-hours capacity, making it the largest storage battery in the world used for electric railway work. Its installation was deemed expedient owing to the fact that that station is the farthest from the power station and the transmission line is exposed to an unusual degree, being carried over Jamaica Bay for 4 miles. Furthermore, the load at Hammel's is very light during the winter and the large battery capacity makes it practicable to shut down the rotary equipment for much of the time during that season.

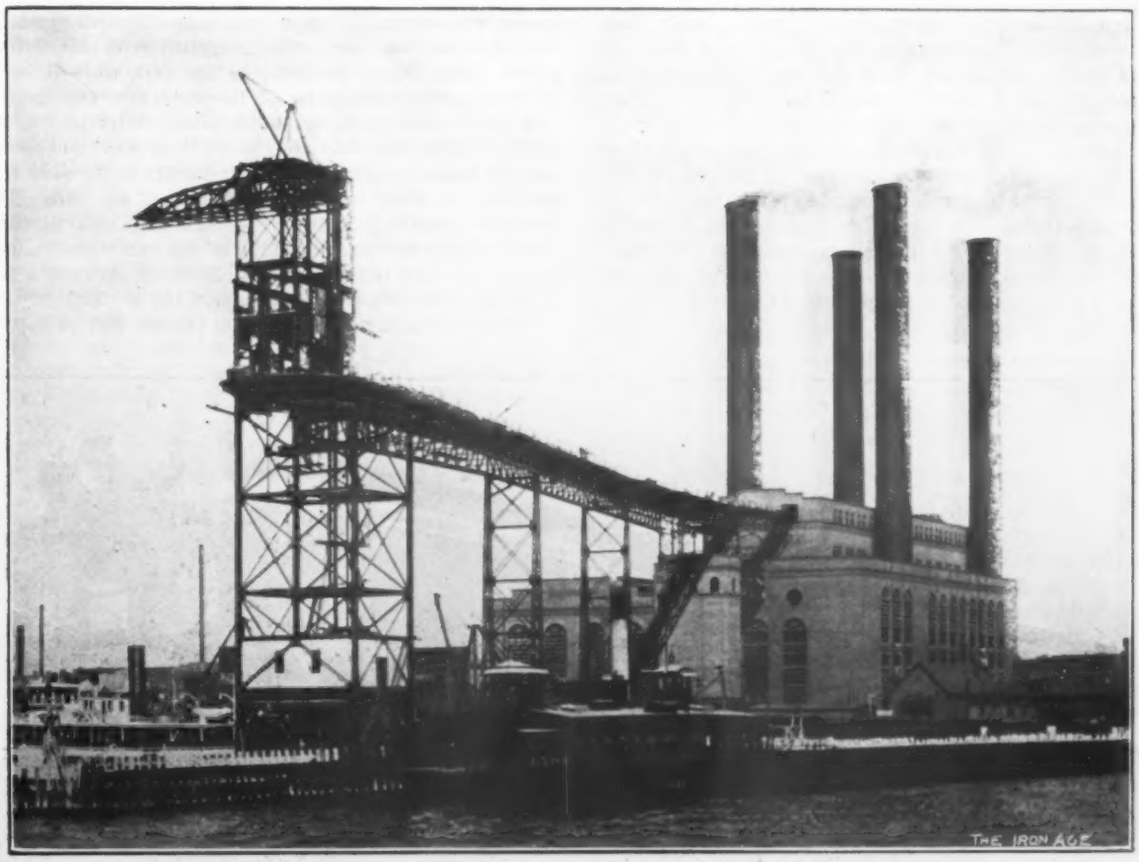


Fig 3.—Exterior of the Power House, Showing Coal Handling Equipment.

Fig. 4.—Interior of the East New York Substation.

Portable Substations.

All of the substations may on emergency have their capacity augmented 1000 kw. by using portable substations. These consist of steel cars each carrying a 1000-kw. rotary converter and three static transformers. Two of these have been built. They were designed primarily not only to reinforce the permanent substations but to maintain the potential at any points where traction might temporarily be very heavy. Such conditions would be met at the different race tracks, and buildings have therefore been erected at Belmont Park Race Track and at Springfield Junction near the Metropolitan Race Track where these substations may be housed and connected up. While the use of portable substations is not new, yet it is interesting to know that they have never before been installed on so large a scale. One reason for their use in this case is found in the fact that no feeders are used for supplying the third rail, the high conductivity

of these rails permitting the discarding of feeders for all ordinary conditions of traffic.

The Third Rail.

Direct current at a potential of 600 volts is led to the third rail from the various substations. Great care has been taken in protecting this rail for the safety of pedestrians. The rail is laid at the standard distance from the track rail adopted by this road, the Pennsylvania road and the Interborough Rapid Transit Company—namely, 27 inches from the gauge line of the track to the center line of the third rail and with the top of the rail 3½ inches above the top of the track rail. Placing the third rail in this position will permit of interchange between the above roads and will provide clearance for steam equipment. The rail is laid on sleepers and is supported by insulators made of vitrified clay. It is covered throughout its entire length with a wooden sheathing. Attached to the rail are brackets of steel, to which are bolted wooden uprights outside the rail, and to these are attached a second set of strong brackets supporting a 2-inch plank at a hight of about 4 inches above the rail. Wherever the rail passes in front of stations a special side sheathing is attached, making it practically impossible for persons crossing the tracks to come in contact with it. Another feature in connection with the protection of passengers is a running board similar to the one covering the third rail, which is placed along the outside edge of the platform and prevents passengers from coming in contact with the collector shoes of the motor cars.

At each side of a grade crossing the third rail terminates in a broad sloping shoe similar to that at switches and crossings in the Subway and on the Elevated. This is considerably within the line of protecting fences that inclose the entire right of way, and a heavy insulated wire cable connects it with the third rail beyond the break. The cable passes underground in a concrete duct.

The total mileage of third-rail installation reduced to single track basis is 97½.

The Trains.

The trains are made up of steel motor cars of the type shown in Fig. 5, of which 130 have already been equipped, and trailers in the ratio of three to two—that is, five-car trains will consist of three motor cars and two trailers, the motor cars being one, three and five. By this arrangement it is possible to make up three-car trains consisting of two motor cars and a trail car by simply taking off two cars from either end of a five-car train. All the cars are furnished with the Westinghouse pneumatic multiple unit system of control and each motor car has two 200-horse-power motors, both carried on the same truck, one being geared to each axle.

The steel cars are quite similar in appearance to those used in the Subway, but local conditions made necessary several important changes. For instance, all the requirements and limitations that applied to the Subway, such as restricted hights and clearances on curves, high speeds with frequent stops, maximum strength combined with the smallest weight, &c., applied with equal force to the Long Island problem, as the cars were intended to interchange with those of the Subway. One feature was peculiar to the Long Island road. After leaving the city limits the cars have to run on the ground and receive and discharge passengers at stations where the platforms do not come flush with the platforms of the cars. This compelled the designing of a special combination platform which should be the full width of the car when running within the city limits and which would provide a pair of steps to be used when running on the surface.

Each motor car weighs 83,000 pounds and is capable of maintaining a maximum speed of 55 miles per hour and a schedule speed, including stops 1.6 miles apart, of 25 miles per hour. Acceleration is accomplished very smoothly and evenly, and stops are made in the same manner.

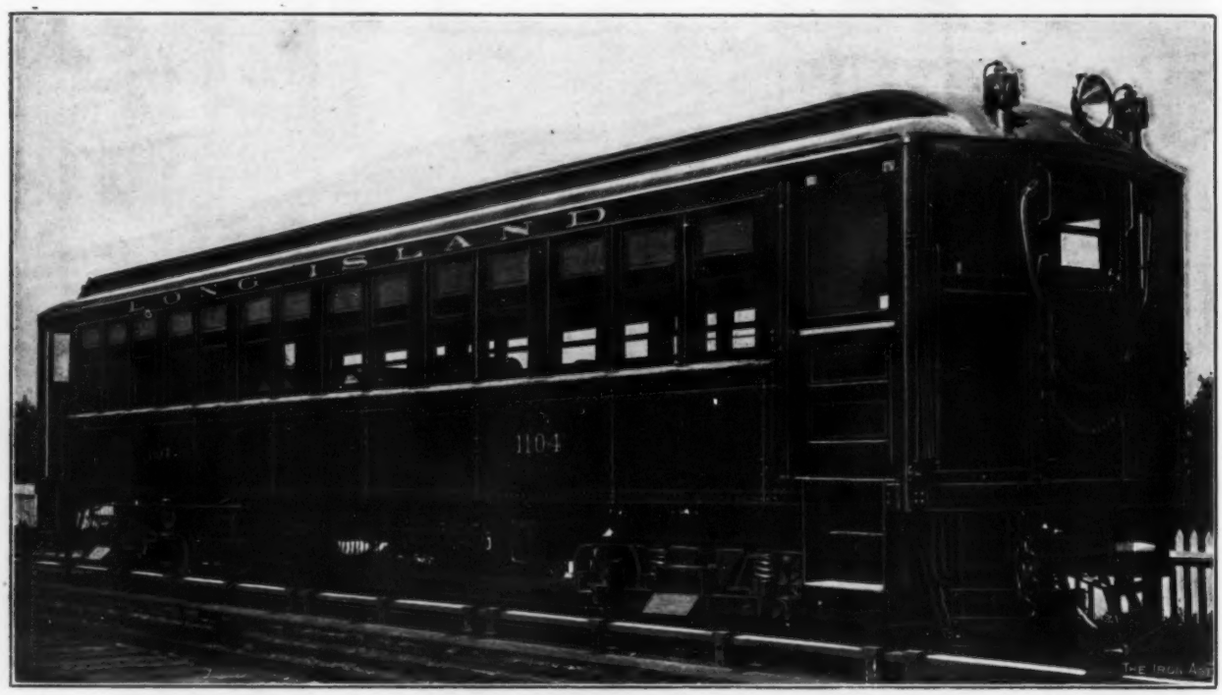


Fig. 5.—One of the Steel Motor Cars.

Westinghouse, Church, Kerr & Co. acted as engineers and constructors of the road and the entire work was done under the direction of George Gibbs, the chief engineer of electric traction of the road. The road was first electrically operated July 26, 1905.

The Worcester Steel Foundry Company, recently reorganized and incorporated, now has its offices in the Central Exchange Building, Worcester, Mass., with foundry at Millbury, Mass. The plant has been enlarged and improvements added, and it is now under the management of men well known and experienced in the trade. In addition to making the ordinary line of crucible steel castings, which in many cases take the place of drop forgings, the company announces that it is prepared to make castings of special steel to meet exceptional requirements, adding more or less carbon as occasion demands. Brass and composition and aluminum castings will also be made. Automobile castings will have special attention. A variety of these have been made, including crank shafts.

Current Developments in Canada.

Tariff Items.

TORONTO, October 28, 1905.—As time passes it becomes less certain that the tariff legislation promised by Mr. Fielding for next session will be put through so soon. The Toronto *Globe's* Ottawa correspondent, who usually speaks on such subjects upon the best of information, regards it as doubtful. He refers to the general desire to have the next session opened early and concluded in as short a time as possible. If it begins early the Tariff Commissioners are unlikely to have their inquiries completed in time for it. As members of the Government they will require to be in their places attending to the duties of their several departments when Parliament is sitting. And no matter how long the session might be deferred to wait on the Commissioners it cannot be kept within the limits of six weeks or two months if the business of revising the tariff as a whole is placed before it. Such business would require another of those protracted, exhausting sessions which seem to have become the rule in recent years. Another long session would be likely to lap over July again. That would render it difficult for the Government to prepare properly for the Colonial Conference, which is to be held in London in that month. However, what the chief Government organ's correspondent at the capital has to say on the subject may be wholly speculative.

Satisfaction is expressed at Ottawa with the work done in the United States by the Canadian officials sent there by the Customs Department to investigate the value of goods shipped thence to this country. The officials in question were added to the customs service for the special work of checking attempts at evasion of the anti-dumping clause of the Tariff law. So far they appear to have had their labors assisted rather than retarded by United States exporters to Canada, who are reported by the officials to be generally frank and courteous. Exceptions are mentioned, but the exporters who refuse to give the necessary information as to prices have to pay a penalty in the form of an added duty, for their names are sent to all collectors. An experience of this kind soon makes contumacious shippers compliant.

A memorandum has been drawn up by the Lake Superior Corporation and will be presented to the Tariff Commission. It is the company's argument for the abolition of the duty on coal. It is the corporation's desire to produce its own coke. The coal, however, cannot be got except by importation, and the duty on soft coal is 53 cents per ton of 2000 pounds, being the equivalent of 65 cents per ton of 2240 pounds. This duty the company could evade by placing its ovens in the Michigan Sault, where part of its system already lies. If it brought its coal from Ohio to the Michigan Sault and turned it into coke in the latter place the product could be forwarded free of duty to the blast furnaces and steel plant of the company on the Ontario side of the Ste. Marie River, for coke is on the free list. At present neither the coal industry of Nova Scotia nor the Dominion revenue benefits by the Lake Superior Corporation's coke consumption, for the coke is imported in the finished state, duty free. Ontario manufacturers as a body would welcome the abolition of the coal duty, for it is a heavy charge upon production and does the Nova Scotia coal mine operators no good, for the latter sell practically no coal in Ontario.

Americans and the Rail Duty.

Alarms are raised on this side of the line from time to time by rumors of diplomatic activity on the part of United States steel interests. Every renewal of the agitation for further protection of the Canadian steel industry has started up stories of new schemes of American competition. When the Dominion Iron & Steel Company first decided to establish a rail mill there was serious talk of furnaces and rolling mills being built in Ontario by the United States Steel Corporation. That talk was revived when the Government was strongly urged to put a duty on rails, but ceased for a time after the act providing for the eventual establishment of such a duty was passed. Then a threatened duty on wire caused a fresh outbreak of the fear that an American steel plant would be located here. The rumors all came on the eve of a Tariff change, as if the object were to make it appear that efforts were being made by the United States Steel Corporation to intimidate capital from going into the Canadian steel enterprises. Once, however, the prospects of the corporation opening up in Ontario seemed quite bright after a tariff change—that is, when the rail duty was finally put on.

Just now, when the work of revising the Canadian tariff is in hand, the bugbear of United States steel interests again puts in an appearance. Several Canadian newspapers have all at once obtained intelligence that manufacturers of rails across the line are bringing some kind of influence to bear upon the Dominion Government to induce the latter to remove the $7 duty or to lower it very materially. Whatever the design of the story, the effect will scarcely be other than to make the Canadian rail duty more popular, for if the Canadian public can be made to believe that there is any intriguing to secure a tariff advantage for foreign rail makers and injure home rail makers there will be an outcry for the maintenance of the rail duty. It looks as if there were some belief that the Government means to lower the duty. At all events statements are being published to show that there is no need to supplement the domestic output in order to meet the demand of the railroads.

The Dominion Iron & Steel Company.

At the annual meeting of the Dominion Iron & Steel Company in Montreal on the 18th President Plummer said that he believed the corner had been turned and the company was on the highway of prosperity. During the last four months earnings had averaged $73,000, while the monthly interest charges are $56,000. Frederic Nicholls, vice-president, who gave his services without remuneration at a critical period in the company's history, resigned, stating that he thought the time had come when his active aid was no longer necessary. He remains on the board. Graham Fraser, the general manager, also resigned. He stated that the open hearth furnaces are now doing their work efficiently. During the past five months they have turned out 10,000 tons each, an increase of 37 per cent. over the previous five months. He assured the shareholders that they might look forward with confidence to an output of from 800 to 1000 tons of rails per day of 24 hours. The rod mill is producing 250 tons per 24 hours at the present time.

Steel Rail Notes.

It is said by the selling representative of the Lake Superior Corporation that the rail mill at Sault Ste. Marie has orders enough on hand to keep it busy well into 1906. Within the last few days orders have been booked for a lot of 100-pound rails for the Michigan Central lines in Canada, and a contract has been received for a British Columbia line. The mill is about to begin on another contract for the Canadian Pacific Railroad, which will bring its purchases from the Sault works up to 75,000 tons.

Two thousand tons of steel rails have been purchased by the Toronto Railway Company for its electric lines in this city. It is stated that the order went to a Pennsylvania company. They are 90 pounds to the yard. Heretofore the company has purchased its rails in England.

The members of the National Transcontinental Railway Commission visited the Sydney rail mill when they were in the Maritime Provinces. They have the ordering of the rails for the 1800 miles of the Eastern Division.

D. H. Ross, commercial agent of the Dominion Government at Melbourne, Australia, has reported to the Department of Trade and Commerce that there is a market prospect for Canadian rails in Australia. He mentions that the Victoria Railway Commission has recently accepted the tender of the Lackawanna Steel Company for an order amounting to $189,295. C. A. C. J.

Anthracite coal is reported to have been discovered in large quantities in the Matanuska district, Alaska, by mining experts connected with the Alaska Central Railroad.

The Fitchburg "Lo-Swing" Lathe.

In shops where manufacturing is conducted on a large scale there are generally many single operations involving sufficient quantities of work to make special machines desirable. These machines, though usually adapted to a limited range of work, are more economical than wider range machines because of their higher producing capacity. The new lathe manufactured by the Fitchburg Machine Works, Fitchburg, Mass., and known as the "Lo-Swing" lathe, is a tool of this class. It was designed by James Hartness, of the Jones & Lamson Machine Company, Springfield, Vt., who, however, has no official connection with the Fitchburg company. It is described as a machine which, like the turret lathe, boring mill and shaper, gets its efficiency at the expense of working range, both in respect to dimensions and kind of work.

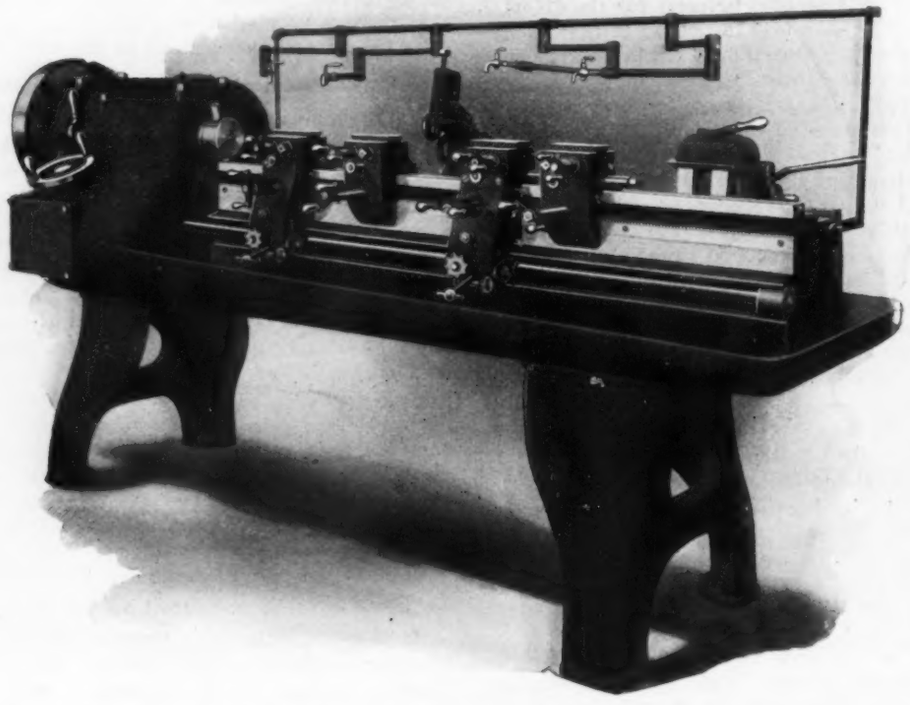


Fig. 1.—The "Lo-Swing" Lathe, Made by the Fitchburg Machine Works, Fitchburg, Mass.

It is not intended for chucking work, screw cutting or any other purpose than the plain turning of work on centers. Two distinctive features are its very low swing, 3½ inches, and its single slide tool carriages, several of which may be used simultaneously. All parts which are unnecessary to this lathe, though essential to the universal or standard lathe, have been omitted to the end of securing more accurate control of the cutting tool and increased speed of turning.

To secure rigid and firm support of the work fixed center rests and traveling follower rests are used, as shown in Figs. 1 and 2. The tools are mounted on low rests, allowing the guiding rail to be brought as close to the work as possible, and the cross traveling screw is located directly back of the tool, so that variations of working strain, from light to heavy chips, have the least effect on the location of the tool.

Each cutting tool used in the lathe is a piece of high speed steel machined to fit closely a ⅝ x ¾ inch hole in the tool holder. The cutting end projects but a small distance beyond the tool holder. The inner end bears against the end of an adjusting screw, which holds it firmly to its work, and being operated by a handle conveniently regulates the depth of the cut. A notch on the inner end of the cutter is adapted to receive a yoke so that the cutter will be drawn back when the screw is retracted. This placing of the cross travel screw directly back of the tool is justifiably considered better than placing the screw several inches below the tool. The cutter does not require any binding or clamping in its holder, because the cutting stress holds it firmly in its pocket and against the adjusting screw. The cutter holder, with its cutter, the adjusting screw and handle, may be instantly removed from its socket in the lathe, as indicated in Fig. 3, by releasing a clamp. There are two sockets in the top of the carriage, into either of which the cutter may be inserted. The tool holder is held in place by a short plug in a hole drilled across the two sockets. An eccentric plug is placed in the unused socket, by turning which the short plug is forced against the tool holder, firmly locking it in position.

The tool carriage is radically different from the standard form. It is a single block of metal fitted to slide on a rectangular guide rail and to carry a cutting tool just as close to the guide rail as possible. The guide rail and sliding blocks are so formed that the cutting strain is squarely borne by the rail. Two kinds of carriages are used, one provided with gears for power feeding and hand traverse and the other for hand traverse only. By means of a connecting bar the carriages without feeding mechanism may be fed by connecting with a power feed carriage. The regular lathe is provided with two carriages of each kind, but more or less may be used according to the nature of the work.

The carriages are only 5 inches wide, so that it is possible to bring into simultaneous use at least two tools on nearly all work over 8 inches long. The greatest length of work the lathe will take between centers is 60 inches. On the regular machines furnished with four carriages tied together in pairs two may be fed in one direction, while the other two are fed in the opposite direction, or all may travel in the same direction. The carriages may be run back past the tail stock without moving it. In spite of their small width they have relatively large bearing surfaces on the guide rail.

Two roller follower rests are regularly furnished with each machine, which may be quickly attached to any of its carriages. There are also supplied two roller center rests, which may be fixed to the bed anywhere between the head and tail centers. The carriages will pass these

center rests just as they pass the tail stock. The rolls used both in the follower and fixed rests are of large diameter, making high speed practicable even on slender work. These rests contribute greatly to the efficiency of the lathe, as they provide means for properly controlling the work by combining the center scheme of support as

range from 560 to 50. All of the running parts of the head have been made with special regard for the requirements for high speed steel. The spindle nose is unlike the usual type, as it is only adapted to carry a center point and a driver for the dog.

The power feed for the carriages is varied by a hand

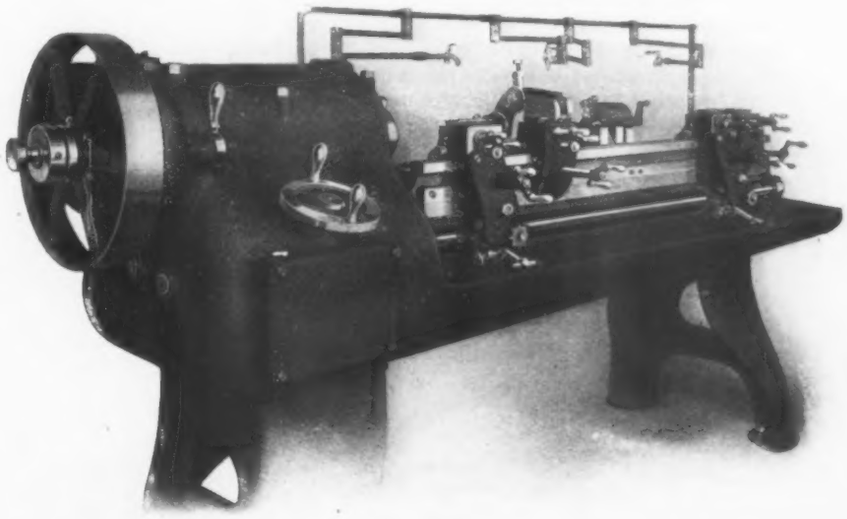


Fig. 2.—A Nearer View of the Inclosed Head Stock.

used on engine lathes with the back rest scheme used on turret lathes.

The bed of the machine is a single casting and comprises the guide rail on which the carriages slide, the drainage pan for chips and oil and the casing for inclosing the spindle and gears. The head stock is a part of the bed casting and is provided with gears for obtaining seven changes of speed, which is a liberal number considering the limited working range. The changes are effected by clutches and mechanism conveniently and

wheel on front of the head, any feed being instantly available. The pump for oil for the cutting tools is in the head end of the machine and is driven from the main pulley. It draws oil from the reservoir under the head, delivering it to the cutting tools, after which it flows back to the reservoir.

The Standard Oil Company is said to have taken steps toward building a pipe line from the Kansas oil fields to the Atlantic seaboard, to parallel one now nearly

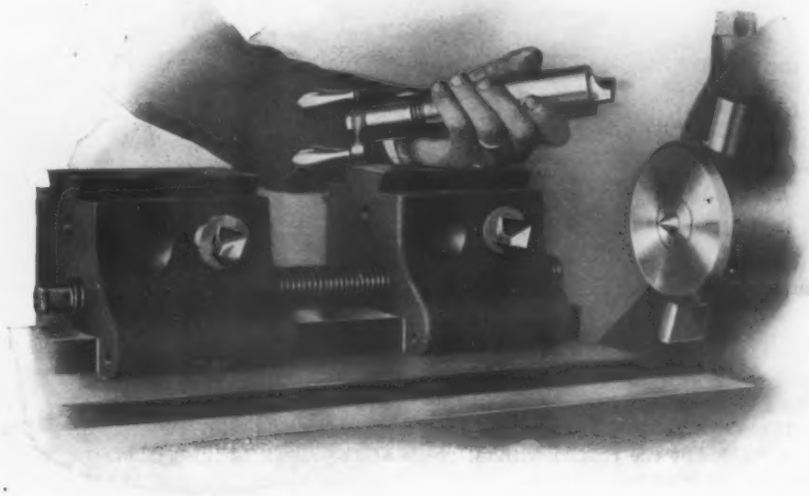


Fig 3.—Detail Showing a Tool, Holder and Adjusting Screw Removed Intact.

quickly operable, but it is necessary to stop the machine when making a change. By omitting provision for changing speeds while running it was possible to avoid complication.

The gears and clutches for changing the spindle speed run in a shallow basin containing oil, into which they dip, thus insuring effective lubrication of all running parts of the head. A single driving pulley is used, 3 inches wide by 18 inches in diameter, intended to run at a constant speed of 560 revolutions per minute. The spindle speeds

completed. The distance is 1700 miles. The heavy demand for American oil abroad to supply the deficiency in the Russian production is stated to be the motive for increasing transportation facilities.

The Erie Railroad Company, which has recently added largely to its equipment, made a contract last week with the American Locomotive Company for 50 locomotives. Twenty-five of these locomotives are to be of the consolidated type and the balance of the Pacific type.

The Espen-Lucas Crank Shaft Forming Machine.

A new crank shaft forming machine designed to facilitate the roughing out and finishing of crank shafts is shown in the accompanying illustrations. In the best usual practice the machining of forged crank shafts embodies a number of operations from the drilling and cold sawing out of the throat of the shaft to the subsequent roughing out and finishing of the sides and ends of the cranks on milling machines, lathes or especially designed tools. This new machine has been designed and built by the Espen-Lucas Machine Works, Philadelphia, Pa., with a view of avoiding the many changes incident to this work, and as shown by the engravings performs the work of roughing out the throat from the lump forging and turning off the ends and sides of the cranks without removing the shaft from the table of the machine.

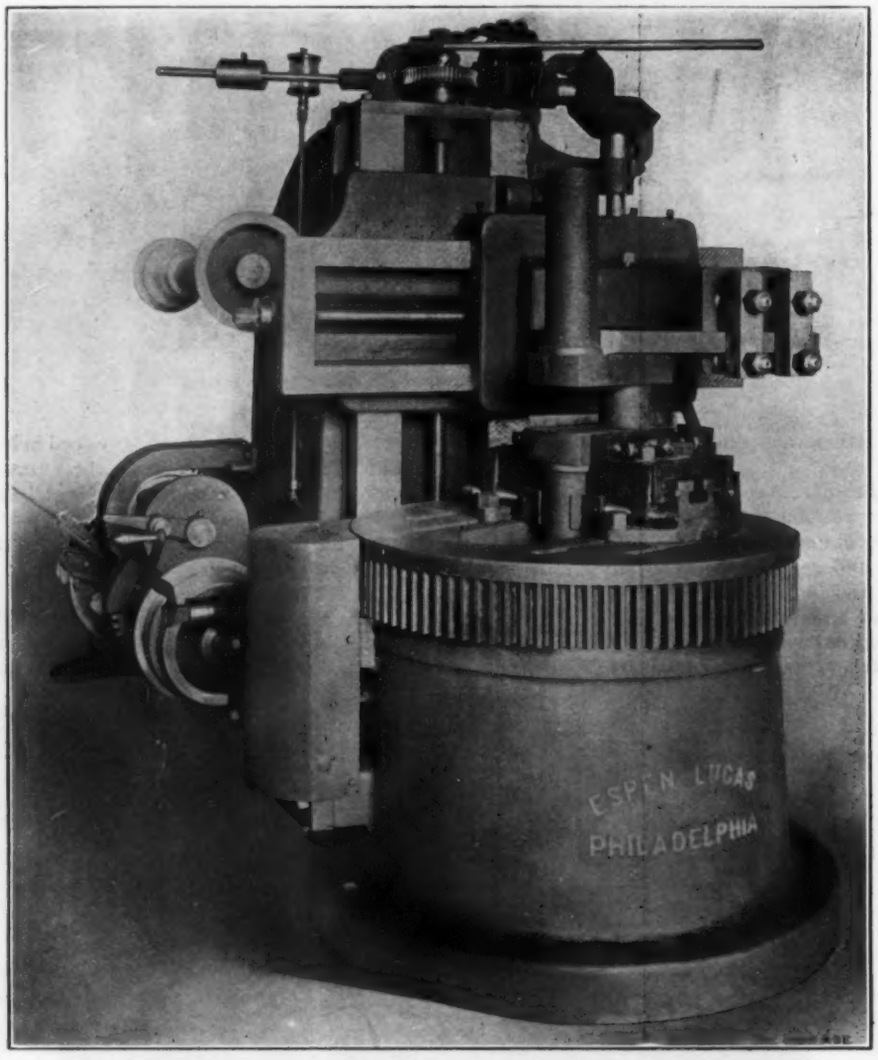


Fig. 1.—The Espen-Lucas Crank Shaft Machine, Showing the Setting for Turning the Outside of the Cranks.

In performing this work the shaft is held firmly in a vertical position. The necessity of balancing the unequal weights of the forging in jigs as on a lathe is avoided and the machine may be operated at a high rate of speed. The work is held in a patent universal vise for roughing out and a stationary vise for finishing. These vises are securely clamped to the table, and are easily adjusted to different sizes of shafts, a graduated scale enabling the operator to perform this work quickly and with precision.

This machine, which is designed to rough and finish crank shafts having up to 20 inches throw, is very heavy in all its parts, weighing complete about 20,000 pounds. Steel castings are used for the principal working parts of the machine, while the gears with the exception of the one on the table, which is cut from a solid steel tire, are all of hammered crucible steel, cut from the solid. They are covered so as to protect them from falling chips or other matter. The bearings are all lined with bronze.

The head of the machine is counterbalanced and has a vertical movement of 24 inches, while the tool holder has a horizontal travel of 40 inches, and both head and tool holder have power feed in all directions. Cutting tools up to 2½ inches wide are used, and may be clamped solidly, either in a vertical or horizontal position. As a tool in the latter position usually has considerable overhand, it is backed by a movable tool post to prevent its chattering. The machine is driven by a variable speed motor of 15 horse-power capacity.

Fig. 1 shows the machine as it is used in turning and finishing the outside of the cranks. In Fig. 2 the tool is in position for roughing out and finishing the throat of the shaft. Fig. 3 shows the manner of turning the ends of the cranks, and Fig. 4 shows the machine facing the cranks.

Fig. 5 illustrates a crank shaft in the rough and finished, on which this machine performed the work of taking out the throat, which was 3 inches deep, turning off the ends and sides of the cranks, then facing off the top and bottom faces of the cranks, the complete operation being performed in 1 hour and 30 minutes.

This machine is also adaptable for use as an ordinary boring mill and can be used for other general machine work.

The business of manufacturing pyrometers, revolution indicators and other scientific instruments, founded by Edward Brown, 311 Walnut street, Philadelphia, whose death was announced last week, will be continued

under the name of Edward Brown & Son. Mr. Brown's son, Richard P., was taken into partnership with his father September 26 of this year, and the name of Edward Brown & Son was then adopted as the style of the firm.

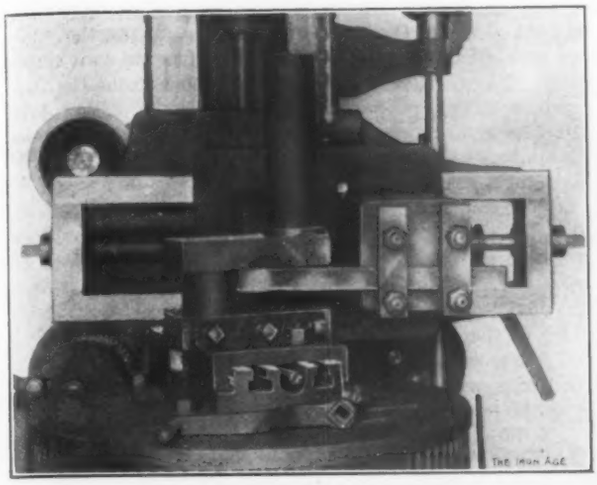


Fig. 2.—The Setting for Roughing Out and Finishing the Throat.

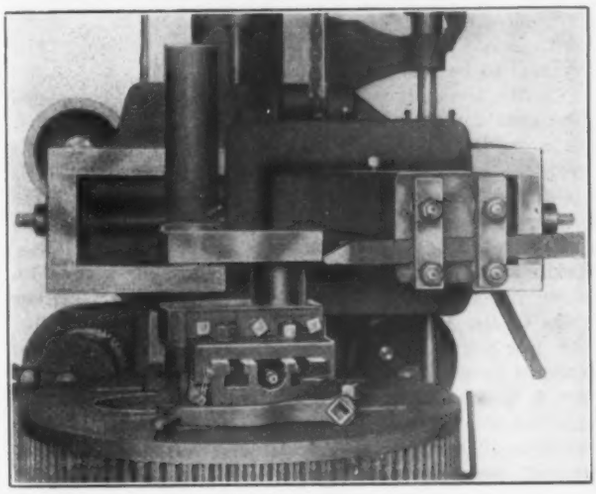


Fig. 3.—The Setting for Turning the Ends of the Cranks.

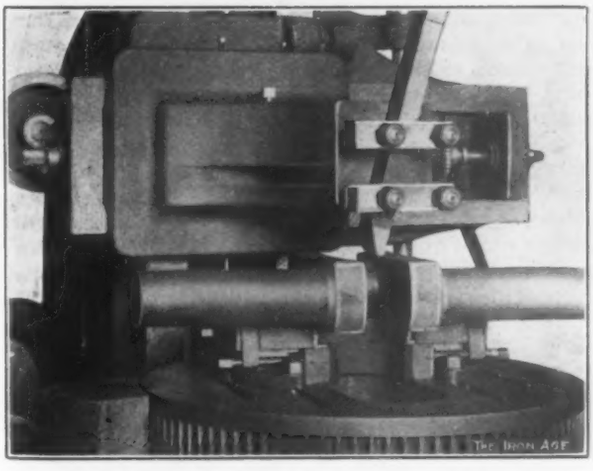


Fig. 4.—The Setting for Facing the Cranks.

The instruments are manufactured under Edward Brown's patents.

In the construction of the new Boston Store Building, at Chicago, 40 caissons, each extending 106 feet below the street grade to rock bottom, and measuring 8 to 10 feet in diameter, have been sunk and filled with concrete since July 15, establishing a new record for work of this kind. The piers required 140,000 cubic feet of concrete and in the last few days the steel columns which will rest on these piers, each weighing 15 tons, were set in place 42 feet below the street level, thus making provision for three stories below the first floor.

A New Bar Mill.

The Rockaway Rolling Mill has acquired the rolling mill property located at Rockaway, N. J., and will start rolling bar iron November 13. The works are being altered and enlarged. Six new furnaces are being built, new steel roughing rolls are being installed, the puddle mill is being completely changed, and new machines for shaping the raw materials rapidly and economically are being erected. A modern electric plant for light and power is being built and such tools will be electrically driven as economy dictates. New engines and boilers are being added to the plant. The remodeled plant will be devoted to the manufacture of refined bar iron for the jobbing and large consuming trade. By reason of the improvements the capacity of the plant will be doubled, the capacity being upward of 20,000 tons per annum and employing about 200 hands. Numerous new methods will be inaugurated for facilitating the movement of raw materials and finished products. The main office is located at Rockaway, N. J.

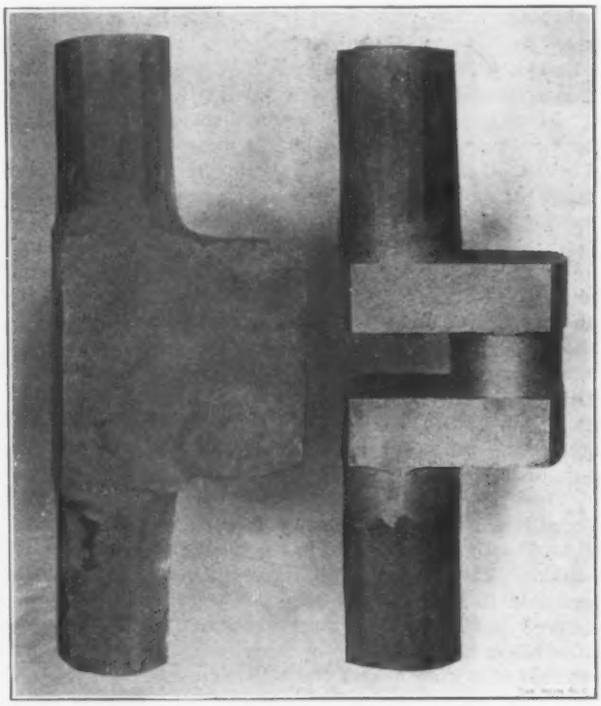


Fig. 5.—A Rough and a Finished Crank Shaft.

Among the products made are puddled, double refined and hammered bar iron; axe, axle, boiler brace, boiler rivet, bolt, bridge, car, chain, engine, hame, horseshoe, locomotive, machinery, hot pressed and cold punched nut, screw, ship, ship rivet, spike, square edge tire, staybolt, structural rivet, tank rivet and tool iron and soft steel bars, also muck bar, billets and blooms, telegraph telephone and trolley line material and cross arm braces.

An advantage as a steam raising fuel possessed by oil as compared with coal is the remarkably steady steam pressure which may be obtained by means of the liquid fuel. This is due to the fact that the oil fires do not require the periodical cleansing demanded by those supplied with coal, and automatic logs of steam pressures on ships using oil as a fuel can easily be made to show as little as two pounds maximum variation of pressure for a run of 24 hours or more. This of course conduces to economy in the operation of the engines, and greatly facilitates the working of the boiler, which is under conditions that are kept constant, instead of having the 30 per cent. drop in pressure which is sometimes noted on an overloaded boiler when it is found necessary to clean the fires.

An Important Canadian Ore Deal.

DULUTH, MINN., October 28, 1905.—The Moose Mountain iron ore properties, lying about 18 miles north of Sudbury, Ont., have been this week the scene of an important deal. A two-tenths interest has been sold to Mackenzie & Mann, builders of the Canadian Northern Railroad, for $500,000. The interests sold were those of Chase S. Osborne of Sault Ste. Marie and John C. Spry of Chicago. Another minority interest is under negotiation for sale to the same parties. The Canadian Northern Railroad is building from Toronto westerly toward a connection with its present lines running from the north shore of Lake Superior into the northwestern wheat districts of Canada and headed for the Pacific. A slight deflection of the main line will pass it across the Moose Mountain properties, and a line of about 70 miles in length will connect the ore with deep water on the north shore of Georgian Bay. The railroad has agreed with the remaining owners of the Moose Mountain district that it will make a low rate to the lake, a rate that will give a gross freight from the mines to lower lake receiving ports of about $1 a ton. It is from this fact that the great importance of the purchase by Mackenzie & Mann arises.

These properties were discovered some three years ago by a prospector who reported his finds to Mr. Osborne. The latter interested Joseph Sellwood of Duluth, who made an examination. Two years ago last April Mr. Sellwood, John W. Gates, John Lambert and a few associates, including Blair & Co., New York bankers, and John J. Mitchell, president of the Illinois Trust & Savings Bank, Chicago, bought the lands, paying therefor about $10,000. Sufficient exploration has been made to show a very great value, and there are many millions of tons of excellent magnetic ore exposed above water level. This ore is partly Bessemer, with a large portion running from 0.06 to 0.07 per cent. in phosphorus, while the bulk of the ore so far as determined carries above 61 per cent. of iron.

These deposits are located along the west branch of the Vermillion River, in Nipissing district, and extend for 30 to 40 miles, much of it in an unsurveyed district of Algoma. The company, an interest in which has just been sold to Mackenzie & Mann, controls the most pronounced part of the formation, extending for several miles along the trend of the range, and there are great outcrops of iron in a bluff like situation. At least five of these outcrops can be made into shipping mines as soon as transportation is furnished. The nearest railroad line to these properties now is the main line of the Canadian Pacific, which passes 18 miles to the south. The distance to the village of Killarney, on the north shore of Georgian Bay, is about 70 miles. Ore shipping piers will be built near Killarney and work begins this winter.

The Chicago and New York gentlemen who went into this proposition did so on the recommendation of Mr. Sellwood, and so far as I can understand none of them has even yet been on the ground. He made careful examination there before recommending its purchase and took a large interest himself. Reports have since been made by Walter Fitch, then superintendent of the Champion mine and until lately general manager of the United States Mining Company at Salt Lake City, in which he stated that "indications warranted the belief that the discovery of the Moose Mountain range was the most important since the Mesaba in the history of the American iron ore trade." C. K. Leith of the United States Geological Survey estimated that there were in sight in these properties, at a time when there had been little or no exploration done, at least 10,000,000 tons of 60 per cent., and above, while of lower grade ore, but yet merchantable, not less than 140,000,000 tons, provided in each case that the ore extends to a depth of 250 feet. Drilling has been done, showing this condition to exist at the points where the holes went down.

The prospector who originally found these deposits was paid a few thousand dollars and the purchasers afterward spent more than $100,000 in locating, securing titles, exploring and drilling the lands.

November Ore Shipments.

The probability is that ore shipments from the Minnesota ranges will be slight after November 1. Already a few nights of frost have had their effect in freezing ore in steel cars and delaying traffic. Big shippers, more especially the United States Steel Corporation, have been pushing ships to the head of the lakes during the summer and letting their eastern range shipments wait somewhat. They will probably produce more from the Menominee range, proportionately, during November and early December than from any other points. It is the expectation of Escanaba lines that shipments thence will continue till about December 15.

On account of the probability of late shipments therefrom the roads handling ore to Escanaba have not been in favor of steel cars and have continued the use of wood for a car building material. They have no intention of trying steel. The Chicago, Milwaukee & St. Paul, which is the newer line in the trade, is now considering the construction at its own shops this winter of 300 wood cars with steel underframing for a load of about 48 gross tons, or a trifle over 50 net tons. These will be the largest ore cars ever built of wood, though the same road has been successfully using a wooden car that carries almost 50 net tons for the past two years. This on a wheel base of but 19 feet and 22 feet over all is pretty good for wood. The railroad is dredging for a second ore shipping pier at Escanaba to be of 50,000 tons storage capacity, with 200 250-ton pockets. It is expected to be ready about next July.

On the Menominee Range some mines have completed shipments for the year. Monroe of the Buffalo & Susquehanna Company is through, with 92,000 tons as its record. This is the best year this mine has had. It is a siliceous ore, rather low in iron, and is mined by the milling process. Breen Mine at Waucedah is through, with a total of 25,000 tons, its first year's business. Vivian Mine at Quinnesec is about through, with a total of 75,000 tons, a trifle less than last year. Other mines of the Verona Mining Company are doing better than last year. Old Appleton Mine at Loretto is to be explored by diamond drill, the well-known firm of Longyear & Hodge having taken contracts for this work. It has been idle for ten years and its gross shipments were less than 13,000 tons. Baltic Mine is not quite through, but will clean up with 200,000 tons for the year. The old Cuff exploration at Norway is to be reopened and the Katonka Iron Company has been organized with a capital of $1,000,000 to explore and operate it. This is a Philadelphia company, with F. J. Hathaway of that city as president. The Chicago & Northwestern Railroad expects to ship off the Menominee Range this year about 3,000,000 tons and from the Marquette about 1,000,000 tons.

Gogebic shipments by the Oliver Iron Mining Company this year will amount to about 2,900,000 tons, of which the Norrie, Aurora and Pabst will move about 2,000,000 tons. Other shippers off the same range will make the total about 4,000,000 tons. Reference has been made to the activity of the Cleveland Cliffs Iron Company on the Gogebic range and to the large acreage of mineral lands it was taking, both east of Sunday Lake and west of the Montreal River. It is still taking lands about the western end of the range near Iron Belt and other mines, and has appropriated a large sum of money for their development. It is operating drills on its lands at the east end of the range.

Many interests, notably the Great Northern Railroad, have been active of late in closing up on options along the western Mesaba and have taken out of the market about all the land showing indications of iron ore. The activity of this railroad is due probably to an early change in the ownership of its ore lands, a deal for the sale of which is understood to be ready to close, if not to announce.

D. E. W.

The population of the city of New York, according to the census recently completed by the State authorities, was 4,014,304 on June 1, 1905. The territory covered includes Brooklyn, Queens, Staten Island and the Bronx.

The Newton Heavy Duplex Milling Machine.

A new heavy duplex milling machine has recently been placed on the market by the Newton Machine Tool Works, Inc., Philadelphia, Pa. The spindles of this machine are 6 inches in diameter and have a full bearing in the saddle 29 inches long. They are driven by a triple thread worm and worm wheel of steep lead, the worm being of case hardened steel and the worm wheel of phosphor bronze. Power is supplied through gearing by a 25 horse-power variable speed motor. In addition to the variation in speed obtained through the motor three additional changes of speed are obtained through the driving mechanism, as may be seen in Fig. 1. This mechanism comprises slip gears, and through a lever having three positions the changes can be readily made from one gear to another.

The spindle saddles are counterweighted, are 27 inches long and have a full bearing on the upright, the face of which is 22 inches wide. The uprights have in and out adjustment on the wings. The carriage is 30 inches wide, 6½ inches thick and 11 feet long over all, to mill a length of 10 feet. It has a 6¾-inch bearing on each of the two ways of the machine and is operated by a spiral pinion and rack. There are ten changes of feed, ranging in geometrical progression from 54-100 inch on the slowest speed to 12 inches per minute on the highest speed, with power quick traverse in either direction and hand adjustment. The automatic feed can be thrown out and the quick traverse operated or the table can be operated by hand from either side of the machine. The levers controlling the various movements of the machine may be seen in the view given in Fig. 2.

The maximum distance from the center of the spindle

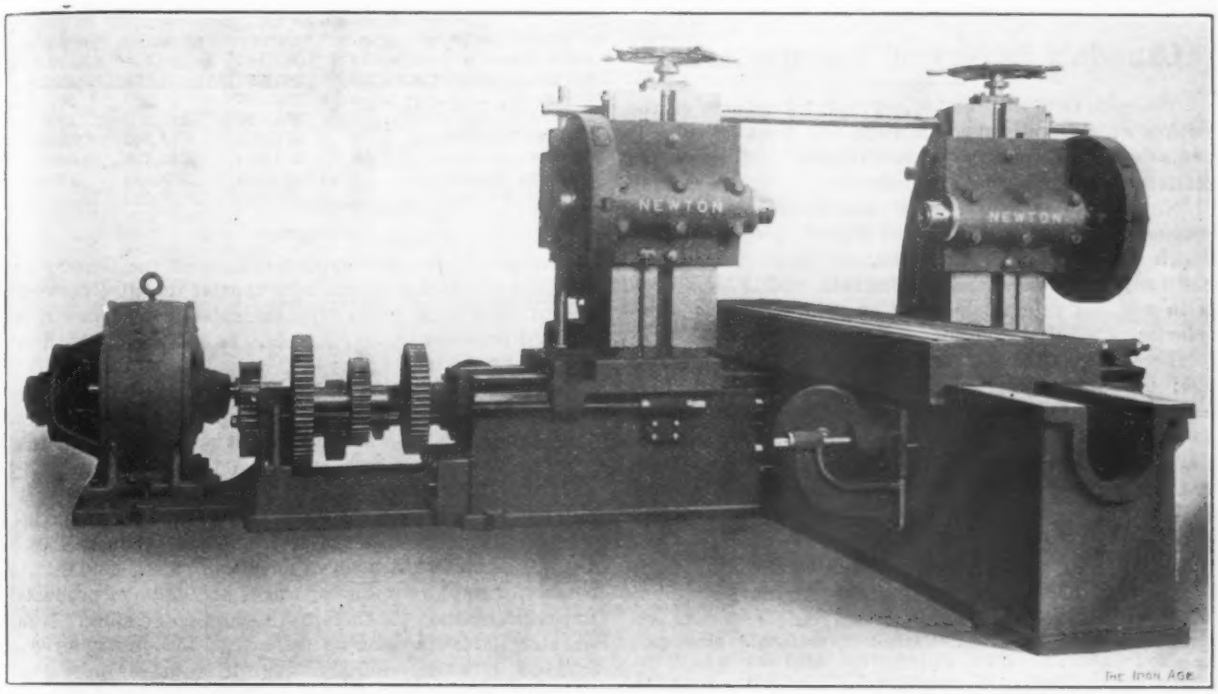


Fig. 1.—View of the Driving Side, Showing Extended Base for the Motor and Change Gearing.

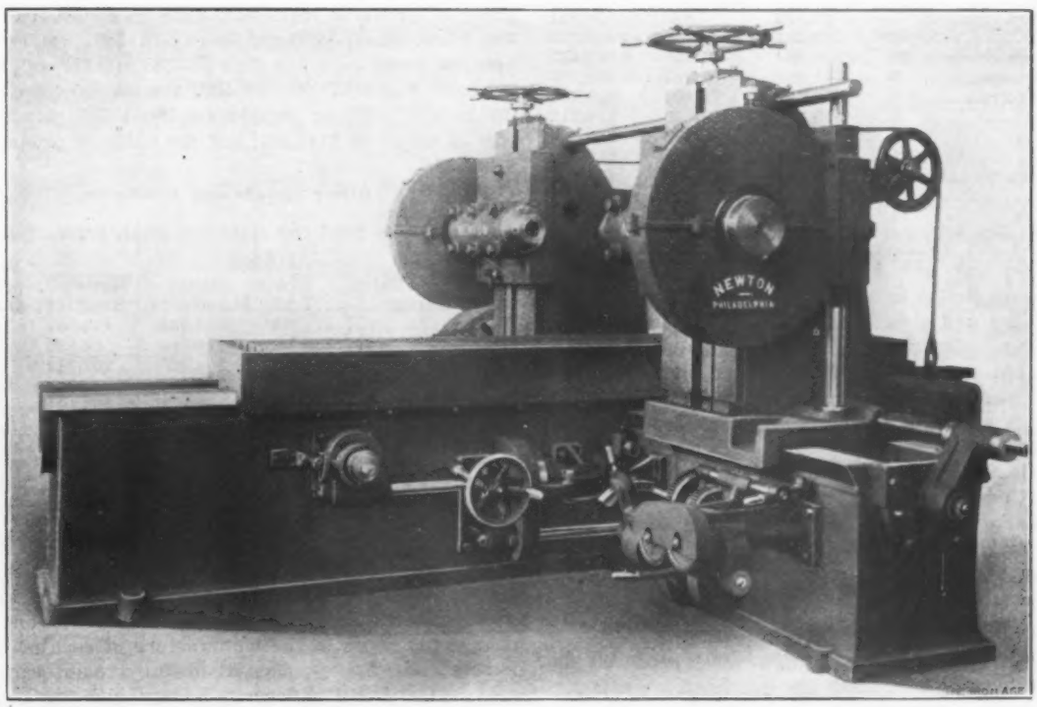


Fig. 2.—View Toward the Opposite Side of the Bed, Showing the Controlling Levers and Mechanism.

to the carriage is 26½ inches and the minimum distance 5 inches. The maximum distance between the ends of the spindles is 60 inches and the minimum distance 18½ inches. The maximum distance between the uprights is 77 inches. Where desired the machine can be arranged so that both spindles may be simultaneously adjusted vertically. The approximate net weight of the machine is 43,000 pounds.

Canada's Census of Manufactures.

TORONTO, October 28, 1905.—The third volume of the Census of Canada, taken in 1901, has been issued. It deals with the country's manufactures. Of these the statistics are summarized as follows:

Number of manufacturing establishments, 14,650; classes of industries, 264; total capital, $446,916,487, of which $209,378,638 is in lands, buildings, machinery, motive power, tools and implements and $237,537,849 is in working capital; persons on salary, 30,691; total salaries, $23,676,146; persons receiving wages, 313,344; total wages, $89,573,204; crude materials used, $149,508,062; partly manufactured materials used, $117,019,796; miscellaneous expenses, including rent of works, rent of power and heat, fuel and light, municipal taxes, provincial taxes, office rent, interest, insurance, internal revenue tax and contract work, $24,688,837; total products, $481,053,375.

Articles of Iron and Steel.

In the iron and steel group of industries the facts collected are presented in the following table:

Kind of industry.	Establishments.	Capital.	Cost of material.	Value of products.
Axes and tools	21	$1,169,607	$367,603	$1,038,705
Boilers and engines	59	5,552,862	1,783,915	4,626,214
Bridges	6	1,755,379	1,012,563	1,693,000
Cutlery and edge tools	7	316,325	82,710	257,275
Dies and molds	3	16,000	9,930	33,600
Foundry and machine shop products	315	16,274,645	5,293,248	15,292,445
Gas machines	4	29,850	7,899	29,121
Hardware	6	418,381	164,774	401,821
Iron and steel products	29	9,829,560	3,801,129	6,912,457
Printing presses	5	541,064	90,139	362,135
Safes and vaults	3	232,610	70,100	225,200
Saws	7	419,534	127,685	314,312
Scales	8	279,414	92,153	285,240
Screws	4	714,586	198,025	385,310
Seeding machines	3	1,110,167	342,976	752,308
Wire	15	1,599,118	1,060,011	1,693,995
Wire fencing	14	225,950	199,801	336,470
All other industries	8	376,112	112,230	238,294
Totals	517	$40,861,164	$14,816,891	$34,878,402

Car wheels, chains, knitting machines, knitting needles, skates, stamps and stencils are included under the head of "all other industries." The leading industry of the group is that designated "foundry and machine shop products," which embraces furnaces, heaters, iron pipe, machinery of all kinds, radiators and stoves. "Iron and steel products" comprehends bolts and nuts, forgings, hinges, nails and tacks, rivets and spikes and rolling mill products. Under "axes and tools" are classed files, forks, machine knives, shovels and spades. The industry in which the ratio of wages cost to value of product is lowest is wire making. The ratio is 10.73 per cent. In needle making the ratio is 55.5 per cent.

Vehicles.

Vehicles for land transportation were produced as indicated below:

Kind of industry.	Establishments.	Capital.	Materials.	Value of products.
Bicycles	16	$1,052,700	$299,753	$550,606
Car repairs	26	4,535,257	4,412,415	7,546,644
Carriages	349	6,615,525	2,972,648	6,650,912
Carriage materials	27	1,315,318	655,133	1,269,271
Cars and car works	7	2,475,602	2,252,339	3,954,172
Totals	425	$15,996,402	$10,592,288	$19,971,605

Vessels for water transportation are accounted for as follows:

Kind of industry.	Establishments.	Capital.	Materials.	Value of products.
Ships and ship repairs	39	$3,156,369	$699,634	$1,899,836
Boats and canoes	18	141,545	46,312	143,832
Totals	57	$3,297,914	$745,946	$2,043,668

Miscellaneous Industries.

Included in the group of "miscellaneous industries" are agricultural implements, electrical apparatus and supplies, elevators, pulleys, railway supplies, roofing and roofing materials, washing machines and wringers. These taken from the general list of miscellaneous industries are exhibited as follows:

Kind of industry.	Establishments.	Capital.	Materials.	Value of products.
Agricultural implem'ts.	114	$18,207,342	$4,128,526	$9,597,389
Electrical apparatus,&c.	25	5,267,397	1,131,004	3,032,252
Elevators	4	196,423	77,830	207,100
Pulleys	3	205,520	111,200	248,000
Railway supplies	4	573,155	214,742	556,600
Roofing	11	257,050	280,220	569,640
Washing machines	6	128,673	103,850	179,434
Electric works	58	11,891,025	47,562	2,008,017

Progress.

Comparing the industrial condition of the country at the date of the last census with that at the time the census of 1891 was taken the Commissioner shows that marked progress has been made. In respect to the iron and steel industries he says:

"The group of iron and steel products shows an increase of 6096 in the number of employees, $3,426,352 in wages and $6,342,613 in the value of products. Axes and tools were compiled with cutlery and edge tools in 1891, and the statistics of these industries brought together for 1901 shows that the number of employees has increased 615, the wages $257,137 and the products $398,476. Iron and steel bridges have more than doubled in number of employees, cost of wages and value of products and machine shop products have made no advance. Iron and steel industries show an increase of 1565 in employees, $824,962 in wages and $2,555,727 in value of products. The next largest increase in the industries of the group is shown in the manufacture of boilers and engines, in which the number of employees grew from 1691 to 4028, the cost of wages from $690,775 to $1,845,574 and the value of products from $2,433,878 to $4,626,214. Printing press, stamp and die works in 1891 employed 127 persons, whose earnings were $54,330 and the value of the products was $153,600. In 1901 the manufacture of dies, molds and printing presses employed 345 persons at a cost of wages of $142,444, and the value of products was $395,735."

Other Metals and Products.

Under this head the statistics given are as follows:

Kind of industry.	Establishments.	Capital.	Materials.	Value of products.
Brass castings	23	$1,145,403	$449,745	$1,099,557
Jewelry, &c.	35	613,053	401,244	996,313
Lamps	3	111,010	16,636	117,491
Lead bars and pipes	3	338,925	201,742	293,216
Metal roofing	4	385,119	275,028	495,500
Plumbers' supplies	6	588,162	453,804	221,584
Plumbing, &c.	252	4,468,296	3,250,122	6,553,997
Silversmithing	12	781,456	281,956	740,969
Smelting	12	10,483,112	1,685,018	7,082,384
Watch cases	4	846,642	373,111	707,840
All others	9	621,327	328,496	652,450
Totals	363	$20,382,505	$7,716,902	$19,561,261

Besides the industries referred to by name in the above list there were seven others which are included in the general item "all others." There was one establishment engaged in the manufacture of each of the following: Air brakes, babbitt metal, cream separators, gold leaf and foil and spray motors, and two establishments each making lanterns and printing types.

Cost in Canada and United States.

Tables are given in which the cost of production is analyzed and the elements are compared with those of the cost in the United States. Iron and steel products in Canada have 33.87 per cent. of their value charged to labor, 42.48 to materials and 5.95 to miscellaneous expenses. In the United States these elements are, respectively, 24.53, 49.35 and 10.79 per cent. of the value. Hence in Canada there remains 17.7 per cent. of the value for profit or other allowance and in the United States 15.33 per cent.

C. A. C. J.

The Flather Four-Speed Device for Planers.

On metal planers there is a need of some arrangement by which various cutting speeds may be secured without altering the speed of the return stroke. The Mark Flather Planer Company, Nashua, N. H., has for some time been experimenting to accomplish this result and has brought out the device herewith illustrated. It is an attachment which gives four speeds, the ratios between which may be whatever the customer specifies. The device is securely inclosed in a metal casing and may be mounted either on the housings or on a countershaft overhead, or wherever it is most desirable. It is adapted to any make of planer. The four speeds are obtained by two powerful friction clutches, each operated by a lever within easy reach of the operator. Accident or injury to the mechanism is precluded by a stop, which prevents the simultaneous action of the levers, making it impossible to engage more than one of the frictions at a time.

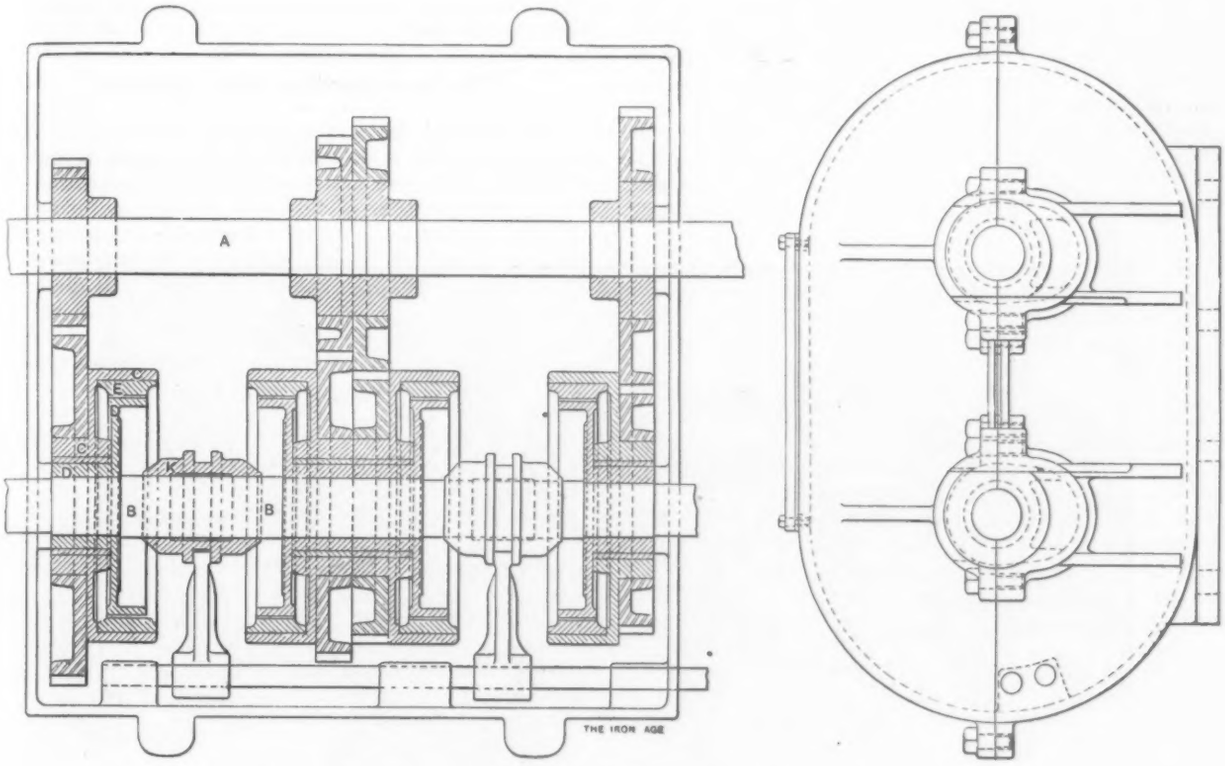


Fig. 1.—Section and End Elevation of the Flather Four-Speed Planer Driving Device.

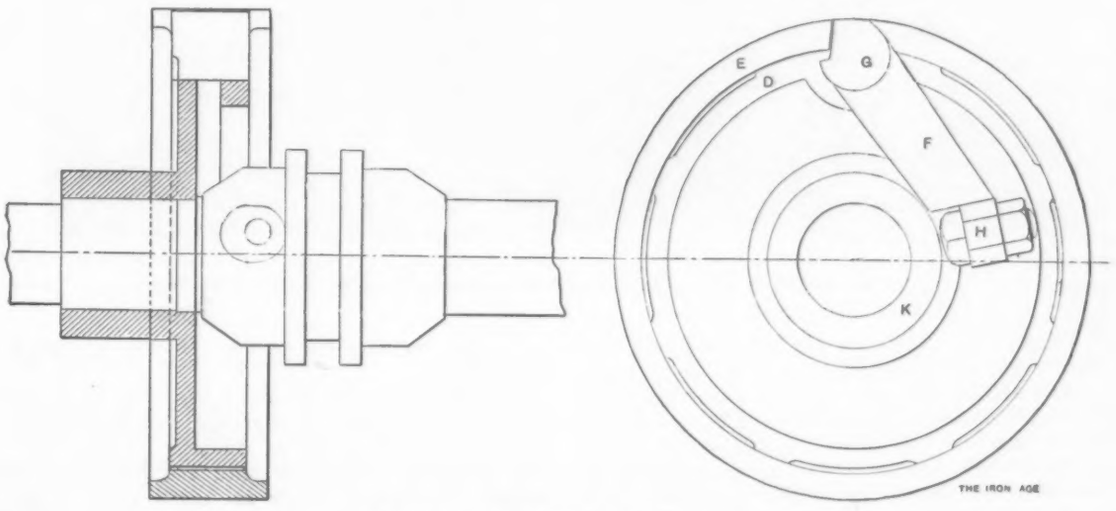


Fig. 2.—Detail of One of the Clutches.

Fig. 1 shows a section and end elevation of the attachment. Power is transmitted from a countershaft or motor to the shaft A, which runs at a constant speed. From this shaft the drive is transmitted for the return of the carriage, so that its speed is constant regardless of the cutting speed in use. Shaft B carries four large gears, meshing with corresponding gears on shaft A, the ratio between the several speeds being obtained by the ratios in this system of gearing. Each of the four gears on shaft B is keyed to a casting corresponding to C, against which a friction ring, E, acts when it is desired to throw any one of the speeds for cutting. Each casting, C, runs loose on a bushing, D, which is an extension of the casting that supports and guides the friction ring and is integral with it. The bushing D is keyed to the shaft. When either friction cone K is thrown in to one side or the other and the friction ring expands the associated large gear becomes integral with the shaft and the drive is direct from shaft A to shaft B through two gears. The other three speeds of the device may be obtained in the same manner.

The clutch employed is a powerful one, as will be seen from Fig. 2. The friction ring E is split, leaving an opening, which fits the cam C. The lever F, which is

pivoted at G, is attached to the stud H. When the cone K is thrown in the stud rides upon the cone and brings the cam face of the lever against the blunt end of the friction ring, expanding it with a force very much in excess of any demand that may be made upon the clutch in the operation of the planer.

Armor Plate Plant of the French Admiralty.

Some details are given in London *Engineering* of the armor plate works which the French Admiralty is now completing at the Forges de la Chaussade at Guérigny, in the Nièvre Department, in the center of France. Two Siemens-Martin furnaces have been installed for the manufacture of steel by the acid process on a basic hearth. The furnaces are of 18 and 12 tons capacity, respectively, and are served by six gas producers. In the same building with the furnaces are the ingot reheating furnaces and the rolling mill. The rolls are of chilled cast iron 1.1 meter (3 feet 7 5-16 inches) in diameter and 3.7 meters (12 feet 1⅝ inches) long. As is usually the case, the top roll is balanced hydraulically and its position is governed by mechanically driven setting screws. The rolls are fitted with a system of special bearings, the object of which is to enable the manufacture of taper plates direct in the mill. Devices to obtain this have been tried repeatedly, says *Engineering*, and so far as we know they have never given any very great satisfaction. The rolls can take rectangular ingots the maximum thickness of which is 0.850 meter (33.46 inches), the maximum weight being 30 tons, equal to the capacity of the two steel furnaces. Cast steel live rollers driven by a small reversing steam engine and toothed wheel gearing are placed over a length of 9 meters (29 feet 6 inches) on both sides of the mill.

The rolling mill is driven by a reversing engine built to develop 6000 horse-power at 120 revolutions. The engine has twin cylinders, the diameter of these being 1.2 meters (47.42 inches) and the stroke 1.3 meters (51.18 inches). Reversing is obtained by the action of an hydraulic relay. The engine drives the rolls by straight toothed gearing. It is supplied with steam by five Babcock & Wilcox boilers, built by the Fonderies et Ateliers de la Courneuve, near Paris, the French Babcock boiler works. These boilers have each a heating surface of 330 square meters (3550 square feet). The shops are served by overhead travelers of ample power. A powerful hydraulic shaping press has been provided. The Admiralty has yet to install equipment for carbonizing, machining and hardening the plates. The acquisition of licenses for the best processes of manufacture and the organization of a capable force are important factors in the new undertaking.

The New Gardner Disk Grinder.

The disk grinder and accessories, including an improved lever feed table and disk wheel press, herewith illustrated, have been designed by F. N. Gardner, the inventor and originator of this type of machine, and are now being built by the Gardner Machine Company, Beloit, Wis.

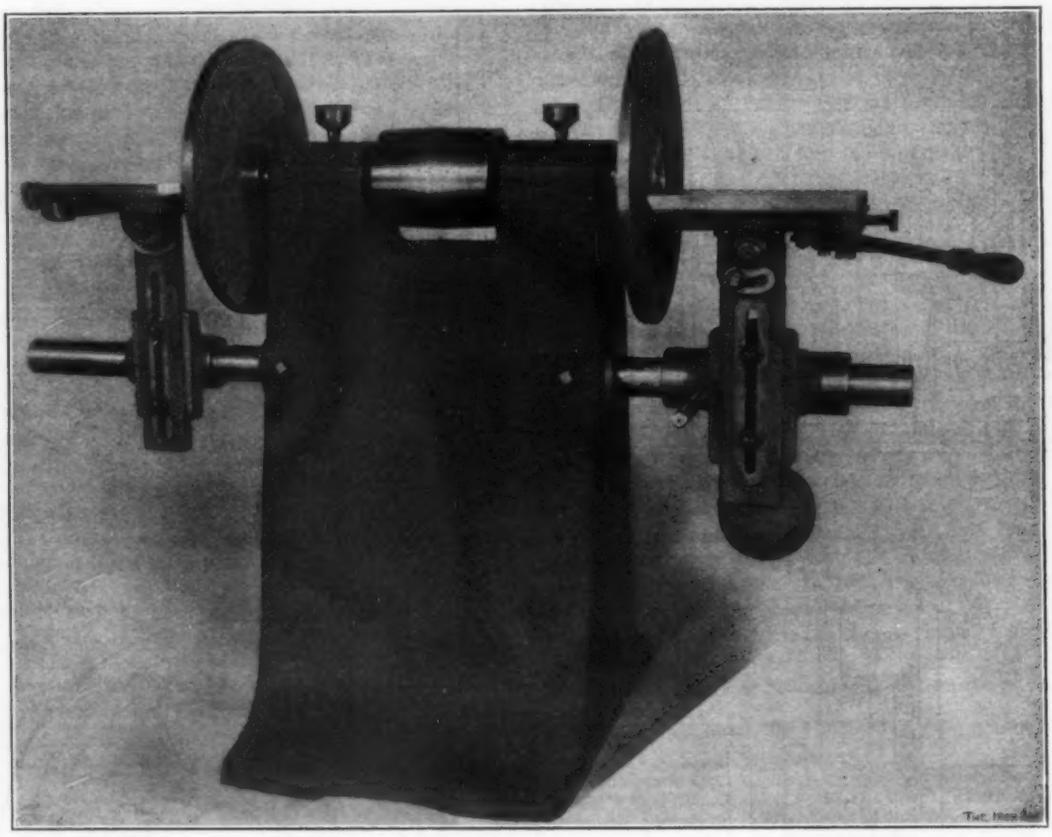


Fig. 1.—The No. 4 Gardner Disk Grinder with Right Hand Table Equipped with Lever Feed.

The No. 4 grinder, shown in Fig. 1, is equipped with disk wheels 20 inches in diameter, but the machine will swing wheels 24 inches in diameter if required. The disk wheels are unusually thick and the spindle, wheel flanges and driving pulley are made much larger and more massive than heretofore. The end thrust, which is an important factor to be considered in disk grinding, is taken from both directions at the right hand box on hardened collars having 9 square inches area. The work tables are large and can be set at any angle by graduations. The right hand table swings around the rocker shaft across the face of the wheel and is provided with an adjustable counterweight. Both tables are provided with adjustable gauges for grinding the work. The gauge on the left hand table can be slid off, leaving the top of the table entirely plain and clear. The rocker shaft is made extra long to allow the use of the lever feed table and also to provide room for solid cup wheels or emery cylinders held in chucks.

The lever feed table on the right side in Fig. 1 is made either right or left hand and can be used at either

or both ends of this grinder instead of the regular tables. It is designed especially for heavy and rapid work and by its use any allowable pressure of the work against the wheels can be obtained on all sizes and classes of work. The top of the table is 9 inches wide by 14 inches long and is mounted on a gibbed slide, which is protected from dust by sheet metal shields fastened to the underside. It is provided with T-slots for ½-inch bolts, by means of which holders for all kinds of work can be secured to the table in any position required. Graduations on the segment make it possible to set the top of the table at any angle from horizontal to 45 degrees. The movement of the table is governed by a fine threaded stop screw at the back. The weight of the table is 180 pounds.

The disk wheel press shown in Fig. 2 will admit wheels up to 23 inches diameter. The pressure is obtained by a hand lever and a differential screw, the threads in the arm being three to the inch and in the plate four to the inch. The arm and the plate can be swung entirely clear of the base. By using the carrying attachment shown heavy wheels can be easily handled. The supporting yokes can be used on only one size of wheel, but extra sets with screws attached are furnished for any size required up to 23 inches. The advantage claimed for this press is that heavy wheels can be faced perfectly with little exertion and there is no danger of disturbing the facing before the glue sets.

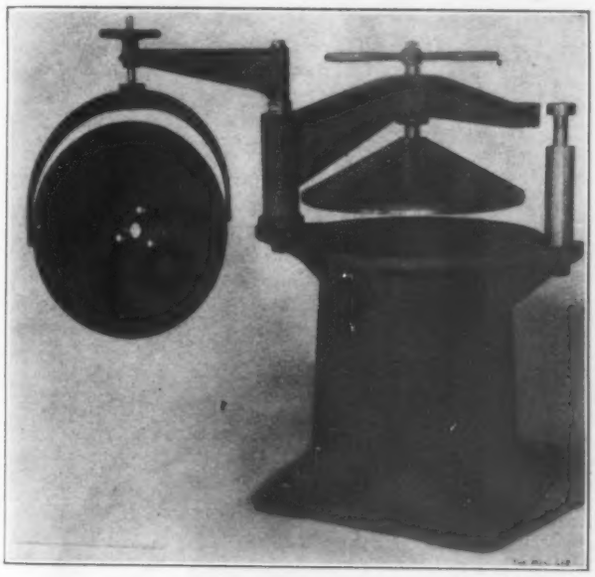


Fig. 2.—The Gardner Disk Wheel Press.

The German Steel Syndicate and State Railroad Scrap.—It has been announced in Germany recently that the Prussian State Railroad authorities have approached the German Steel Syndicate with a proposal that the latter become the sole buyer of the large amount of railroad scrap iron which has hitherto been offered for sale on public bids at various times. As the scrap iron so far disposed of by the railroads represents about one-half of the tonnage annually sold in the country, it would seem that the proposed arrangement between the Government railroads and the Steel Syndicate would tend to exclude a large proportion of the old iron merchants from the business, and it would place the non-syndicate open hearth steel works largely at the mercy of the Steel Syndicate for their supplies of scrap iron. The report of such a proposition being under discussion has aroused opposition, and the attention of the Minister of Commerce and Railways has been called to the matter. There have been intimations at various times that the Steel Syndicate, by buying up the available supplies of scrap, might bring pressure to bear upon the open hearth producers who have thus far held aloof from the combination, but the suggestion has not been taken seriously.

Sweden and the Lapland Iron Mines.

A Stockholm correspondent of the London *Times* gives some facts concerning the commercial side of the iron ore development in Scandinavia. The Swedish State railroads, it is stated, have increased their income greatly in recent years, so that from these and other State properties the Government is able to pay the interest on its debt and make the proper sinking fund provision. This, too, when the 700-mile railroad leading from the central iron districts to the iron ore deposits in Lapland has as yet made a poor return on its cost. At its northern end this railroad connects with the cross line from the Swedish port Lulea in the Baltic to the Norwegian port Narvik in the North Atlantic. Part of the cross line, about 300 miles, which runs on Swedish soil, was commenced by English contractors with English capital, but was purchased by the Swedish Government when the Lapland mines—the Gellivare, Kirunivare and others—began to put out such large quantities of iron ore that it became important to ship part of the ore from a port like Narvik, which is free from ice all the year round.

The value of the export from Sweden in 1904 of pig iron, bars and partly manufactured iron was about £2,600,000 and the value of iron ore exported was £1,380,000. The tonnage of iron ore shipped was 3,380,700, its value being thus about 8 shillings per ton in Sweden. The increase in the amount of iron ore raised in Sweden during the last fifteen years is remarkable; during the previous thirty years the amount rose from about 400,000 tons in 1861 to about 1,000,000 tons in 1890, during which time most of the ore was turned into pig iron within the country; since then the export of ore has caused a rise to last year's yield of over 4,000,000 tons. The increase of the ore raised from 1902 to 1903 was 21 per cent. and 11 per cent. from 1903 to 1904.

About two-thirds of the ore was exported from the Lapland mines and the remainder from the Grangesberg district in Central Sweden. Most of it went to Germany either direct to the German ports in the Baltic or by transshipment through Holland, but large and increasing quantities of Swedish ore will no doubt be sent from Narvik to the East Coast of England, as will the Norwegian iron ore, which, though poorer when raised, will be enriched by electro-magnetic methods before shipment. All the iron ore raised in Sweden is magnetic with the exception of some 300,000 tons, and most of it is very pure. Some 90,000 tons of ore taken annually from the central deposits at Dannemora and Persberg hold only about 0.003 per cent. of phosphorus. These are used partly for the production in Sheffield of the finest crucible cast steel for cutlery, springs, &c., and partly as pig iron shipped to the English makers of heavy ordnance. The Lapland ore is not so free from impurities as these, but most of it is purer than any English ore other than the best hematite. Some of the Swedish ore is less pure, but this is kept carefully distinct and is used for enriching the poorer ore abroad for purposes where, by the Thomas-Gilchrist basic method, the impurities can be rendered harmless.

Last spring a proposal was put before the Swedish Riksdag to charge an export duty on iron ore in the same way that a duty is charged in England upon exported coal. It was felt that while the Swedish mining concessions had long ago been fixed at extremely low rates in order to benefit the Swedish iron industry it would be a national loss if very large quantities of ore were allowed to be exported without any chance of the Swedish iron works earning anything by even partly manufacturing the iron, and some fear was expressed that the export of ore might increase to such extent that in future there might not be any left for Sweden itself. One of the chambers of the Riksdag accepted the proposal, but the bill was thrown out by the joint vote of both chambers, which is always taken when the two chambers disagree, and the question of export duty on iron ore is not likely to be again raised for many years, if ever.

Niles Furnace of the Carnegie Steel Company, Niles, Ohio, turned out in 24 hours recently 367 gross tons of Bessemer pig iron.

The Buffalo Foundrymen's Association.

The regular monthly meeting of this association was held at its headquarters, 685-687 Ellicott square, Buffalo, N. Y., on the evening of October 17. President Lyman P. Hubbell occupied the chair and 27 members and visitors were present.

W. J. Patchell, president of the Union Iron & Foundry Company, St. Louis, Mo., happened to be in the city on business. He was invited to attend the meeting, and after the regular order of business was disposed of he gave a very interesting talk on a molding machine he had invented and which is being very successfully operated in his plant. A vote of thanks was tendered him.

The chair introduced L. C. Dodd, consulting metallurgist associated with the Snow Steam Pump Works, Buffalo, who read a paper on the "Metalloids of Pig Iron." After a general discussion of the paper, during which many questions were asked and answered by Mr. Dodd, the meeting adjourned.

The Tennessee Company Will Build a Pipe Foundry.—The Tennessee Coal, Iron & Railroad Company, Birmingham, Ala., has determined upon the erection at Ensley, Ala., of a cast iron pipe foundry of a capacity of not less than 5000 tons per month. Plans have been under consideration for some months and a representative of the company has visited many of the pipe works in England, Scotland and on the Continent in order that advantage may be taken of the latest and most improved methods employed abroad, as well as in this country. It is the intention to make the plant as complete as possible and introduce all of the approved labor saving devices.

Improvements to the A. B. C. Induced Draft Fan.

In handling hot gases with a fan, as in an induced draft equipment for boilers, it has been found practically impossible to give the fan shaft a suitable bearing at the inlet side. A bearing here would necessarily be constantly surrounded by hot gases. The better procedure is therefore to use an overhung wheel, having in addition to the two engine bearings a bearing on the engine side of the fan but none on the inlet side. In the usual form of construction the third bearing is separate from the engine, which is subject to the objection that it cannot readily be lined up with the two engine bearings.

In Fig. 1 is shown a new method of construction recently adopted by the American Blower Company, Detroit, Mich., which overcomes this trouble. In this all of the journal boxes are cast in the engine frame, as shown in Fig. 2, and are bored at one operation with the same boring bar. It is therefore impossible for them to be out of line and a self aligning bearing for the fan, such as would otherwise be necessary, is not required, which simplifies the arrangement. The fan bearing is water cooled and ring oiled, and it will be noticed is supported by the engine bed and not by the housing of the fan as is commonly the case. This simplifies the construction by doing away with the additional bracing usually found on fan housings.

Fig. 1.—The New Driving Arrangement for an Induced Draft Fan Developed by the American Blower Company, Detroit, Mich.

The wheel, Fig. 3, differs somewhat from the ordinary construction. In place of the usual three spiders is substituted one heavier one, built of I-beams cast into the hub. The blades are braced upon each other, as shown in the engraving. A wheel constructed in this manner has been shown to be fully as strong and rigid as one of three-spider form. By the use of a single spider the necessity for more than one hub on the shaft is obviated and the

load of the wheel is concentrated upon a comparatively short length of shaft. The casing is made with a deep cone, as shown in Fig. 1, so that the fan bearing may be placed very close to the fan; in fact, the bearing is included within the width of the fan blades. Were the fan of the ordinary three-spider design the center of gravity would be some distance out from the bearing and there

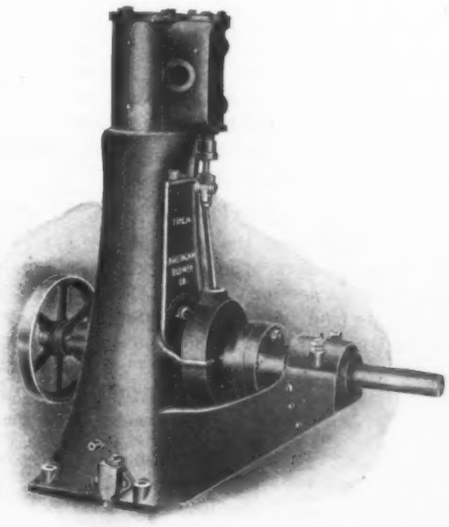


Fig. 2.—The Engine and Attached Third Bearing.

would be a tendency for the shaft to act on the fan bearing as a fulcrum and cause an upward thrust on the engine and the engine journal caps. With the single spider this effect is not appreciable.

The engine is of the inclosed type, oiled by a recently devised pump, which distributes copious streams of oil over all of the reciprocating and revolving parts, even

Fig. 3.—The Wheel with Single Spider Instead of Three.

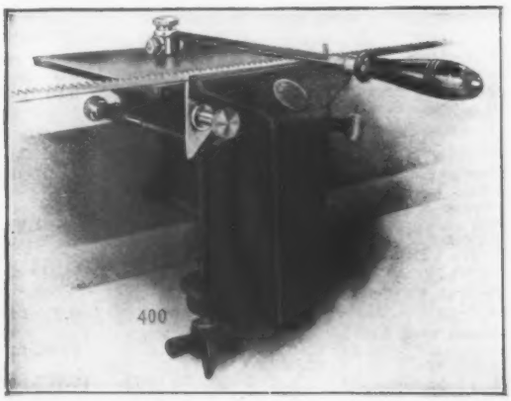
lubricating the eccentric outside of the frame. Tests in actual practice have demonstrated that it will run several months without oiling or adjustment.

The Toledo Furnace Company, Toledo, Ohio, one of the furnace interests of Pickands, Mather & Co., Cleveland, Ohio, will begin in the near future the erection of the second furnace provided for in its original plans for the Toledo plant. The furnace will be of the same size as the present one, 20 x 80 feet, and will be equipped with four Kennedy stoves. A by-product coke plant will also be erected, with a capacity of 400 tons daily, but a definite decision as to the type of by-product ovens has not been reached.

The New Britain Band Saw Filer.

A device that will interest users of band saws is manufactured by the New Britain Machine Company, 41 William street, New Britain, Conn. The band saw filer, as the accompanying illustration shows, is only intended as an aid to hand filing, which is considered to give the best results in band saw sharpening. To preserve the individuality of hand filing and yet make it as nearly mechanical as desirable a vise is provided in which there is no clamping in the old way between every few teeth. The saw is fed along by pressing it from left to right with the file; the hardened vise jaws yield against such pressure and are automatically tightened again after the feeding. The free end of the file is guided by rolls resting on a level plate, which keeps the file horizontal and insures the teeth being filed square across. By locking the file against rotation in its holder any desired amount of hook may be given to the teeth. Interruptions do not affect the work, as it may be stopped and taken up again just where it was left off.

Before a saw to be filed is removed from the machine it is recommended that a piece of stone or emery be held against the dull teeth long enough to rub off the points and so form a gauge to file to in order that all the teeth may be effective in cutting. This makes possi-



The Band Saw Filing Device of the New Britain Machine Company, New Britain, Conn.

ble a regularity of work that is not obtainable by machine filing. A further gain over machines which file the front of the tooth last lies in the possibility of filing the top of the tooth last by working from left to right of the saw while in the position shown in the engraving. This makes the burrs on the teeth, caused by the filing, extend acutely in the advancing direction and gives the teeth an extra keenness.

The filer clamps to any bench not over 2 inches thick and holds saws up to 1 inch wide of all thicknesses from No. 24 to No. 18 Stub's gauge. All saws but the heaviest may be laid in three coils on the bench back of the filer and fed through by the file, as described. The heaviest saws are best handled on wheels, as in the common way, and with the improved feeding method no time is lost in shifting the saw along. It is claimed that a right hand resaw filed on this device and set by the "equal blow" method will resaw a ⅞-inch board into 12 thicknesses. A novice, it is also stated, can become an expert filer and can in a very short time put any band saw into condition to do good work.

Leading electrical manufacturing interests of Chicago have organized for the purpose of giving a trades exposition in the Coliseum from January 15 to 27. It is more than 15 years since an electrical show of any kind has been given in the West, and during the progress of this exposition many of the technical bodies and associations will hold conventions in Chicago, including the National Association of Independent Telephone Manufacturers, Northwestern Electrical Association and the Electrical Salesmen's Association. Thomas B. Mercein is promoting the enterprise with offices at 464 Monadnock Block.

The Iron Ore Supply of the World.

At the last session of the Swedish Parliament the Finance Committee called for a report on the extent of the known iron ore deposits in Sweden and the amount of available native iron ores, as compared with those of other manufacturing countries of the world, and the chief of the Swedish Geological Survey Department, Professor Törnebohm, was directed to submit such a report to the Government. This report as well as critical comments on it by Professor Sjögren and the further report by Professor Törnebohm and General Manager Lundbohm of the Kirunavare mines are presented in full in the September number of the *Teknisk Tidskrift*. As it contains some very interesting data the following article, embodying the substance of the different reports, together with certain additional information pertaining to the subject, have been prepared for our readers.

The accompanying map shows the location of the deposits of iron ore in the various countries to which reference is made.

Sweden.

Beginning with the Scandinavian Peninsula we find that by far the greatest ore deposits are located in the northern part, but the most of the pure ores are to be found in Central Sweden. The following is a list of such ore bodies:

	Tons.	Iron. Per cent.	Phosphorus. Per cent.
Norrbotten:			
Kirunavare	735,000,000	65 to 70	0.5 to 2.0
Luossavare	15,000,000	67 to 68	0.01 to 0.03
Gellivare:			
High phosphorus	50,000,000	50 to 60	High.
Low phosphorus		55 to 70	0.02 to 0.10
Ekströmsberg	25,000,000	55 to 65	High.
Mertainen	70,000,000	55 to 65	Low.
Svappavare (titaniferous)		60 to 70	High.
Leväniemen		60 to 70	High.
Tuolluvare (TiO_2, 0.5 per cent.)		60 to 70	Low.
Central Sweden:			
Grangesberg	60,000,000	50 to 60	0.2 to 1.5
Dannemora and Norberg	45,000,000	50 to 53	0.002 to 0.007
Persberg and Bisberg		57 to 70	0.003 to 0.005
Other mines		50 to 65	0.003 to 0.06
Total	1,000,000,000		

Besides the above ore deposits the Ruotivare (Norrbotten) and the Taberg (Smaland) ores, both of very large extent, have not been taken into consideration owing to their high titanium contents, which at present render them valueless. With a home consumption of only 1,000,000 tons of ore and an export trade (mostly to Germany, England and Austria) of about 3,000,000 tons per annum, the Swedish iron industry would for centuries remain in a secure position, but, owing to the comparatively small amount of the high grade deposits, it is quite natural that voices should already be heard cautioning against all wastefulness, and even asking for an export duty on all but the low grade and high phosphorus ores.

Norway.

As regards Norway, very little actual mining has as yet been done, but steps are now being taken for the concentration on a large scale of the low grade Dunderland ores, the amount of which above the surrounding surface level alone is estimated at some 80,000,000 tons. Following is a list of the Norwegian deposits:

	Tons.	Iron. Per cent.	Phosphorus. Per cent.
Dunderland district	Large deposits.	30 to 40	Low.
Nävarhaugen	100,000,000	30 to 58	Low.
Sydvaranger		30 to 58	Low.

Great Britain.

Proceeding to the other European iron ore fields, Great Britain heads the list with ore deposits, foremost of which are the Cleveland carbonates, which in 1850 were estimated to amount to some 500,000,000 tons, but since that time 250,000,000 tons of the best grade have been taken out, and it is now estimated there remains of this quality of ore only enough to last 20 years. The same condition is thought to be the case at the other English iron ore districts. Following are the principal workable iron ore deposits:

	Tons.	Iron. Per cent.	Phosphorus. Per cent.
Cleveland carbonates, highest grade	100,000,000	28 to 33	0.50
Cumberland and Lancaster	150,000,000		Bessemer
Lincolnshire Oolites		34	Non-Bessemer
North'pton and Leic'shire		25 to 28	Non-Bessemer
Scotland Blackbands		25 to 28	Non-Bessemer
South Wales Claybands		30	Non-Bessemer

Iron ore production of Great Britain reached its maximum in 1882 with a record of 18,000,000 tons, and last year 14,000,000 tons were mined, of which the Cleveland district contributed about 40 per cent. and Lincolnshire and Northumberlandshire about 27 per cent. As the country's total ore requirements amount to 20,000,000 tons per annum, the present difference of about 6,000,000 tons is being imported, principally from Spain (82 per cent.), Greece, Sweden, Norway and Algiers.

Germany.

Germany secured at the close of the Franco-German war immense deposits of minette ore (oolites) in Lorraine, besides possessing those of Luxemburg, and can thus supply its iron industries for centuries to come independent of its several other deposits in the districts of Siegen, Lahn, Ilsede and Silesia. The available deposits of the German minette ores are as follows:

	Tons.	Iron. Per cent.	Phosphorus. Per cent.
German Lorraine	1,800,000,000	30 to 45	0.5 to 1
Luxemburg	300,000,000	30 to 45	0.5 to 1

The present annual production of the Lorraine mines amounts to over 11,000,000 tons, and of the Luxemburg mines about 5,000,000 tons, which, together with about 4,000,000 tons from the other mining districts, gives a total of about 20,000,000 tons of German ore produced. Besides using its own ores Germany is importing some ore from Sweden and France.

The German ores, at the rate now being mined are estimated to last about 240 years, and the Luxemburg ores about 50 years, but with an estimated increased consumption the former would be worked out before the end of the present century and the latter within the next 30 years.

Austria-Hungary.

This country possesses beds of carbonates and brown hematite in Austria and Bohemia and magnetite in Hungary, but is obliged to import much ore, which is brought from Sweden.

France.

This country possesses large deposits of minette ore in Lorraine (Dpt. Meurthe and Moselle and the eastern districts), from which it receives about 66 per cent. of its iron supply and the balance from some of the great red hematite, brown ore and carbonate deposits in Southern and Central France. The ore deposits in French Lorraine are estimated at 1300 million tons and are considered to last only during the next 50 years.

Spain.

This country has only one well-known large ore deposit, namely, that in the region of Bilbao, but other deposits of great magnitude, the extent of which is as yet not well known are located on the Mediterranean in the provinces of Murcia, Almeria and Malaga and vicinity. Following is an estimate of these deposits:

	Tons.	Iron. Per cent.	Phosphorus. Per cent.
Bilbao, Rubio brown ores	50,000,000	48 to 50	Low
Bilbao, Vena red hematite		56	Low
Bilbao, Spathic ores		40 to 45	Low
Asturias	200,000,000	...	....
Sevilla	35,000,000	...	....
Teruel	50,000,000	...	....
Huelva (Cola, containing some S)	18,000,000	...	Low
Murcia (Porman brown ore	60,000,000		Low
Almeria (Herrerias, with Mn 8 per cent.)		52	Low
Malaga (Marbella magnetite			

The Bilbao fields reached their maximum production in 1899 with a total of 6,500,000 tons, since which time the output has been decreasing. The total ore production of Spain at present amounts to about 8,000,000 tons, of which England takes 3,000,000, the balance being exported to Belgium and France principally. Some of the large ore bodies are now owned by prominent English,

Belgian and French iron firms, who thus will have a sure ore supply for their own requirements, but the best export ores are apt to be exhausted within the next decade.

Russia.

Russia's iron ore deposits are of considerable extent, but the quality of the ore, as a general thing, is neither high grade nor pure, with the exception of the deposits in the Ural Mountains, which are rich in iron and free from phosphorus. The greatest deposits are situated in South Russia, on the north shore of the Black Sea, namely:

	Tons.	Iron. Per cent.	Phosphorus. Per cent.
Krivoi-Rog	87,000,000	40 to 65	0.01 to 1
Kerstch (E. Crimea):			
Low grade	833,000,000	30 to 37	1 to 2
Higher grade	13,000,000	37 to 46	1.5
Ural magnetites	..	60 to 65	Low
Central Russia	..	20 to 25	Varying

Part of the Krivoi-Rog ores are exported to Silesia. They are estimated to become exhausted within 30 years should not the Russian Government, as is now under consideration, put an export duty on the best grades of these ores. The Kerstch ores are too low in iron and too high in phosphorus to be at present taken into consideration or to be considered of any importance.

The American Continent.

We find that the known large ore bodies of this part of the world are situated in the United States; the Canadian ores, as well as the South American ores, not having as yet been sufficiently exploited to be taken into consideration. The ore fields referred to are the following:

	Tons.	Iron. Per cent.	Phosphorus. Per cent.
Lake Superior ranges:			
Mesaba	500,000,000	52 to 65	0.03 to 0.08
Other ranges	500,000,000	55 to 67	0.01 to 0.15
Alabama br'n hematite	60,000,000	45	0.1 to 1

The total output of the lake ores (from 1855 to 1904) amounts to some 250,000,000 tons. Based upon the present annual output the total known ore supply would be exhausted within the next 50 years, but with a constantly increasing output they would not last even that long. The Mesaba ore, with the present annual output of about 12,000,000 tons, would, it is estimated, be worked out in the next 15 to 25 years. The Alabama districts have no large ore reserves, and the new East and South districts are uncertain, as also the Western ores, and these cannot, therefore, be counted on at present. With an annual demand for some 35,000,000 tons of ore to supply the present needs of the United States iron and steel industry, and this demand being constantly on the increase, there is little wonder that some of our greatest iron makers have expressed their anxiety as to the possibility of finding an adequate ore supply even for the near future.

Other Countries.

Besides the above enumerated principal ore bodies it is concluded that a great quantity of low grade ores exists all over the world, and special mention is made of the ores of Algeria, Soudan, Kameroon, India, Turkey, Cuba, Mexico, Utah, Oklahoma, Newfoundland, New Caledonia, western Australia, Ireland and North China (where in the Province of Shansi specially rich ores are said to be found).

Total for All Countries.

To further elucidate this subject, in the following table are given the quantity, in round numbers, of the estimated known workable ore bodies and the present annual product, consumption and exportation of iron ores of the leading iron producing countries in the world:

	Workable ore fields. Million tons.	Present annual output. Million tons.	Present annual home consumption. Million tons.	Present annual exportation. Million tons.
United States	1,100	35	35	..
Great Britain	1,000	14	20	..
Germany	2,200	21	24	2
Spain	500	8	1	7
Russia and Finland	1,500	4	6	2
France	1,500	6	8	..
Sweden	1,000	4	1	3
Austria-Hungary	1,200	3	4	..
Other countries		5	1	2
Totals	10,000	100	100	16

The Iron Ore Supply of the World.—Stars Indicate the Principal Known Deposits.

The world's iron requirements, which in 1800 were only about 2,000,000 tons, have since increased by leaps and bounds, as is seen from the following table, showing the world's total pig iron production during each quarter of the century:

	Million tons. 1800-25.	Million tons. 1825-50.	Million tons. 1850-75.	Million tons. 1875-1904.	Million tons. Totals.
Great Britain	8	40	120	230	398
France	3	10	25	56	94
United States	2	9	31	245	287
Germany	2	7	23	145	177
Others	5	14	31	94	144
Totals	20	80	230	770	1,100

By allowing for low grade ores and waste it has been estimated that the corresponding ore consumption up to date has totalled 3,300,000,000 tons, and as last year's pig iron production reached nearly 50,000,000 tons, the present annual ore requirements must be from 100,000,000 to 150,000,000 tons. At the present rate of consumption, therefore, at least 10,000,000,000 tons of iron ore, or the whole stock in sight, would be required before the end of the present century. By allowing for the increased consumption at the rate of the increased output during the last 30 years Mr. Hadfield, in his presidential address before the Iron and Steel Institute in May last, arrives

at the conclusion that 45,000,000,000 tons of iron ore will be required during the present century.

As to age most of the above mentioned ore bodies have long been known, with the exception of the Mesaba range, opened up in 1892. The Swedish mines are without exception old discoveries, Norrberg having been worked since early in the twelfth century, Dannamora since 1841, Grangesberg since 1600, Gellivare discovered in 1704, Svappare in 1707 and Kirunavare in 1736, although but recently opened up. The present English iron mines have all been opened up within the last 60 years, and of the American lake ores the Marquette range, the oldest, was opened up in 1854.

With the above facts before us and considering the diligent exploration work lately going on all over the civilized world it appears questionable if the new iron discoveries will more than suffice for taking care of the increased home consumption which generally develops with the advance of civilization and the settlement of a new country. Nature's iron supply will probably never be exhausted, but the iron and steel industry will long before the end of the present century undoubtedly have to depend upon and be compelled to utilize many bodies of ore now considered of too lean and inferior a quality for furnace use, made possible by means of roasting and improved concentrating processes, also by new processes for smelting and refining which will be evolved in due course of time.

Conc'usion.

In conclusion Professor Törnebohm makes certain predictions as regards the probable development of the future iron industry, the principal ones being as follows:

1. The ore fields of the present large producing countries—namely, North America, Great Britain and Germany—will be exhausted within one or two centuries, and the high grade ores much earlier.

2. The future centre of the iron industry will, as now, be located where natural fuel abounds, "as the ore travels to the coal and not *vice versa*."

3. As a consequence Great Britain, whose coal supply it is estimated will be exhausted within about 250 years, will thereupon cease to be an iron producing country, while in the United States and Germany, with their much larger coal areas, the iron industry will continue, although being dependent upon imported ores. For the same reason North China, where coal and iron are found associated together, is looked upon as a promising iron centre.

From the last two paragraphs Professor Sjögren takes strong exceptions, contending that the fallacy of this dogma has long been proved and that a great iron industry depends on other factors fully as important as the fuel question, such as the extent, richness and purity of the ores, freight charges for ores, coal and iron products, traffic regulations, &c., and as instances where the "ore does not go to the coal" the following iron making centers are quoted:

Styria, with excellent iron ores, but fuels imported from Westphalia and Moravia.

Luxemburg district, with cheap, easy reducible ores and a good home market, but fuel imported from Belgium and Westphalia.

Bilbao, where pig iron is produced cheaper with native ores and imported coke than either in Cleveland, England, or Westphalia or Liége, or in the Loire district in France.

New Jersey, with rich, native magnetites and an excellent home market, but depending upon Pennsylvania coke.

Portoferrajo on Elba, and Piombino, Italy, depending upon the Elba ores and a protective Government.

Cockerill, Seraing, in the center of the Belgian coal fields, having established steel plants near Bordeaux, France.

Schneider & Co., Creusot, situated in the center of the French coal fields, having established new works at Cette on the Mediterranean.

The large works of the Kraft Company, Stettin, depending upon the Swedish ores and English coal.

The new iron works near Lübeck, which will depend upon English and Westphalian coal and Swedish, Norwegian and Spanish ores.

September Iron and Steel Exports and Imports

Our exports of iron and steel are keeping up very well, considering the extraordinary domestic demand. The September report of the Bureau of Statistics of the Department of Commerce and Labor shows that the total value of all exports of iron and steel and manufactures thereof, not including iron ore, was $12,136,378 in September, as compared with $12,566,980 in August. Taking the commodities for which quantities are given, the following table shows the movement for the month and nine months:

Exports of Iron and Steel.

	September.		Nine months.	
	1905.	1904.	1905.	1904.
Commodities.	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	2,443	8,774	36,206	36,426
Scrap	1,337	5,190	6,129	22,214
Bar iron	2,350	1,541	24,587	22,383
Wire rods	810	287	4,445	14,042
Steel bars	3,003	2,350	16,920	19,755
Billets, ingots, blooms	25,452	26,175	151,976	262,626
Hoop, band scroll	509	32	2,465	2,151
Iron rails	.....	.....	.....	1,387
Steel rails	29,180	62,425	219,248	272,746
Iron sheets and plates	1,059	276	5,401	3,382
Tin plates and terne plates	355	724	6,501	5,382
Structural iron and steel	6,176	6,159	56,180	37,312
Wire	9,011	8,062	98,866	81,144
Cut nails	976	912	6,683	7,507
Wire nails	3,035	1,880	28,224	20,590
All other, including tacks	273	326	3,122	2,200
Totals	85,969	125,113	666,953	811,247

It will be seen from the above table that the total quantity of these commodities exported in September was 85,969 gross tons. The exports of the same commodities in August were 82,317 tons, in July 67,071 tons and in June 71,490 tons. While the figures for the last four months have been increasing, it will be seen by the totals for the nine months that the exports for the whole period of this year have fallen somewhat below those of the corresponding period of 1904. The total thus far in 1905 is 666,953 gross tons, against 811,247 tons in 1904.

Evidently our imports of highly finished iron and steel manufactures are diminishing, as is shown by the fact that the total value of iron and steel imports, not including ore, in September was $2,154,127, as compared with $2,318,502 in August. Imports in the heavy lines, however, are creeping up, as the total quantity of imported commodities for which quantities are given was 43,264 gross tons in September, as compared with 39,504 tons in August and 36,444 tons in July. The great increase in September was in pig iron. Tin plates and terne plates, as compared with August, show a falling off of more than 50 per cent. Imports of iron ore are increasing, the total for the nine months of this year being 650,286 gross tons, against 297,212 tons in the corresponding period of 1904. Details by quantities of iron and steel imports for the month and nine months are given in the following table:

Imports of Iron and Steel.

	September.		Nine months.	
	1905.	1904.	1905.	1904.
Commodities.	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	25,836	8,684	153,051	61,220
Scrap	411	1,121	8,680	11,357
Bar iron	3,250	1,128	21,160	15,784
Rails	2,421	2	14,288	34,231
Hoop, band and scroll	355	698	2,166	1,941
Billets, bars, steel in forms n.e.s.	965	647	10,505	8,849
Sheets and plates	411	159	1,684	3,615
Tin plates and terne plates	4,653	6,793	54,982	56,035
Wire rods	1,442	1,302	12,732	12,034
Wire, and articles made from	227	179	2,811	3,008
Structural iron and steel	3,258	264	7,921	6,768
Chains	16	22	193	292
Anvils	19	7	142	99
Totals	43,264	21,006	290,315	215,233

The total value of iron and steel exports, not including ore, in the first nine months of this year was $102,904,857, against $92,551,947 in the corresponding period of 1904. The total value of imports for the first nine months was $19,565,755, against $16,598,505 in 1904.

Mexican Railroad and Trade Notes.

DURANGO, October 25, 1905.—The rainy season is practically over and its passing finds crops in a most promising condition. As previously noted, the production of cotton in the Laguna district is larger than for several years. From other localities come reports equally favorable in regard to corn and wheat. The satisfactory prospects in agriculture have naturally had their effect upon business, both wholesale and retail. Increased activity is visible in the supply centers, consequent upon freer orders for merchandise from interior points. This activity may be expected to increase and the movement of goods to grow larger in volume from this time on to the end of the year. Advices from the capital say in regard to the local trade: "The hardware stores of the city report considerably better conditions in their lines than have prevailed for several months, and during the next few weeks a good many orders from interior points of the republic will be filled. There is also an increasing demand for agricultural machinery."

Notwithstanding the recent exposures of haphazard management and consequent collapse of certain companies engaged in tropical agriculture foreign capital continues to find investments here, both in lands and mines. The settlement of the currency question has given an impetus to this movement, as was expected. New colonies are being established and large mining properties are being bought by foreigners almost daily. The weeding out of incompetent and dishonest operators in coffee, rubber and other tropical culture ventures can scarcely fail to have a beneficial effect upon an industry which in itself is both profitable and legitimate. The publicity given to the affairs of the one or two recently wrecked concerns upon the isthmus ought to serve as a warning to the class of people in the United States who are beguiled by specious promises of large dividends upon small investments in lines of industry with which they and, in not a few instances, those to whom they intrust their money also are entirely unfamiliar. The opportunities for profitable investment in Mexico are many and the conditions for making such investments were never more favorable than now, but while this is true it is no less true that failure will continue to be the inevitable end of enterprises launched by unprincipled promoters and mismanaged by their inexperienced coadjutors or their dupes.

Proposed Increase of Duty on Zinc Ores.

The large increase in the production of zinc ore in Mexico, which is exported to the United States, and the probability that a prohibitive duty will be placed upon it for the protection of the Missouri zinc miners have awakened much interest here. The feeling seems to be favorable rather than otherwise to such action on the part of the United States Government, the belief being expressed that in the event of Mexican zinc ores being shut out native smelters would be built in the zinc producing States in Mexico for the treatment of the ore and that the miners would be benefited thereby.

Railroad Construction and Concessions.

The Government has extended the time limit for the completion of the Mexican Central's Manzanillo and Colima extension to October 1, 1909. The company is actively pushing the work, both on that line and on the line between Paredon and Saltillo, the contractors augmenting their construction forces daily.

Additional time has also been given for the construction of the Peyton Railroad between Irapuato and Tacambaro. The awarded concession requires that 12 km. of the branch line from Puruandiro to Irapuato shall be finished by October, 1906, and that each year thereafter 12 km. additional shall be constructed, the entire line to be completed within six years.

Application has been made to the State Legislature of Jalisco by Carlos Romero for a concession to build a branch line of railroad between Mololoa and Tequesquite as a part of the Decauville system of mining railroads.

Industrial Notes.

Large orders for mining machinery are coming forward. A few days ago one shipment, comprising 100 freight cars, aggregating 2000 tons, was received by a mining company in the State of Sonora.

In the fiscal year 1904-1905 the imports of merchandise reached a total of $85,861,081.94 gold, being a decrease, as compared with the aggregate for the preceding year. The imports included machinery and apparatus valued at $10,808,119.30. Exports showed an increase.

The Compañia Electrica de Zacatecas, formed some time ago, as announced, to erect an electric lighting plant in the city of Zacatecas, has awarded the contract for the necessary machinery and equipment to a German concern.

During the eight months ending August 31 last galvanized iron sheets weighing 5916 tons, valued at £67,816, were imported into Mexico from the United Kingdom.

The Missouri Valley Bridge & Iron Company, which has the contract for the construction of the bridges on the Mexican Central Railway Company's extension to Manzanillo, will also build the company's wharf at that port and will begin work upon it soon.

The existence of the progressive spirit is thus noted by a Mexican daily journal:

> Within the last few years a considerable quantity of farm machinery, mostly of American manufacture, has been imported into Mexico, and the demand is steadily increasing. Wind mills for pumping purposes are now being used extensively. Steel plows are gradually replacing the old wooden article, and the farmers generally are learning the fact that in order to secure the best results they must adopt modern methods and machinery in the cultivation of their lands. Steam pumps are also being used extensively for irrigation purposes and are bringing under cultivation tracts of land that previously were of little or no value.

Applications for concessions to use water for irrigation and other purposes have been made by or granted to the following: Alfredo Perez Gil, to use the waters of Lake Patzcuaro, Michoacan, for irrigation and power; Rafael Martinez, to utilize the waters of the river San Antonio de Hidalgo, Tamaulipao, for a like purpose; Diego Redo, who has other irrigation enterprises in hand, asks for leave to use the waters of the river Tamazula, Sinaloa; Manuel Campoya would utilize the waters of the river Chuviscan, at the town of San Diego, Chihuahua, for irrigation; Gustave A. Lilliendahl desires to generate electrical energy by using 9000 liters per second from the river San Juan, municipality of Santiago, Nuevo Leon; the Yaqui Copper Company asks through a representative for permission to use a minimum of 346,000 liters per minute from the Yaqui River, Sonora, for motive power; Noberto Dominquez, to use for irrigation and other purposes the waters of the San Pedro River, district of Comargo, Chihuahua; A. V. Espinosa would increase his present irrigation system by using water from the San Nicolas River, in the State of Jalisco, and Luis Gomez Daza and an associate petition for the right to use for motive power the waters of the river Zacatlan, in the State of Puebla.

J. J. D.

The Railroads and Federal Supervision.—A paper bound hand book, 4¼ x 6¼ inches, entitled "For the Railroads," is published for general distribution by H. T. Newcomb, Bond Building, Washington, D. C. It is stated in an introductory note that the book has been prepared for the railroads in order to place before the people of the United States some of the principal facts and arguments showing the gains resulting to producers and consumers from the free action of commercial forces in shipping and transportation. Numerous tables are given showing the rates on various classes of freight and the reductions which have been made in recent years. The intricacy of rate making is emphasized, and the point is made that the natural decline in rates is hindered by too much legislation. Railroad capitalization and railroad incomes are discussed. The number of railroad employees in the United States is shown to have increased from 873,602 in 1893 to 1,312,537 in 1903, while the number of employees per 100 miles of line was 515 in 1893 and 639 in 1903. The action of various bodies in opposition to rate making by a Government commission is cited, and on the subject of Government ownership quotations are made from various sources. A number of pages are devoted to railroad conditions in foreign countries.

Cargo Sampling of Iron Ores at Lake Erie Ports.*

BY W. J. BATTLE & SON, CLEVELAND, OHIO.

With each succeeding year in the history of iron ore mining the output has increased and to meet this increase the vessel owners have built larger and larger boats until now we have the modern ore carriers with enormous capacities. As the output has increased so have the carrying and unloading devices, railroads, docks, &c. With this progress from year to year we have found it necessary to make changes in the method of sampling. Up to the time of the installation of the clamshell the sampling of boats was not such a difficult proposition. At that time boats were unloaded by shoveling the ore into buckets, the shovelers working down through the ore in the center of each hatch to the floor and then working out. This naturally gave good faces of ore to sample. With the slowness of unloading the sampler found better walls of ore to sample and could take more time.

The method of unloading at present varies at nearly every dock and the method of procuring samples varies accordingly. For example, at the Erie docks, Cleveland, where three clamshells are used, the boats are clamped out until bottom is reached in all hatches; then the boat is shifted to the Brown bucket machines and unloading is finished by hand. In this case we aim to sample the ore when the boat has left the clams. At the Cleveland Furnace Company's docks, Cleveland, are two Brown clamshells that clamp out the ore until bottom is reached, when at once scrapers are put in and the ore between the hatches is scraped to the center of each hatch, where the clams can reach it. In this manner the entire boat can be unloaded by the clamshells, and the sampler takes his sample from each hatch before the scrapers are used. On other docks the above methods of unloading are used and in some cases unloading by hand or buckets is used entirely. In all cases the sampler obtains his sample when bottom is reached in each hatch. By following out this rule we obtain a good average sample, no matter whether the cargo is a mixture of several ores or not.

We all know that the greatest responsibility in doing this work lies in the sampling and to this we give our most careful attention, employing men that have a deep sense of honor and honesty, together with judgment and reasoning power. With these qualities we give them practical instruction in the method of sampling in Cleveland on the docks before sending them to other ports to take charge of our work. We have been fortunate in keeping the same sampling force intact each season and thereby lessening the chance for error.

How Samples Are Taken.

By "Lake Erie ports" we mean all the docks from Detroit, Mich., to Tonawanda, N. Y. Our method of sampling is the same at every dock along the above frontage. The necessary tools used in sampling are a large sized trowel, a hammer and a wide mouthed can with a capacity of about 45 pounds. With these the sampler enters the boat when bottom is reached, sampling every hatch in the following manner: Starting from one side he goes around the walls from bottom to top, taking one-half a trowelful of ore from every 18 inches, the distance between his perpendicular sampling being 24 inches. When lump ore is encountered he takes a piece in bulk equal to the amount of fine ore taken on each trowel sample. When he has filled his can he dumps this upon a clean floor space in the boat and proceeds until each hatch has been sampled. After completing this work he goes over his sample carefully, cracking up the lump so that the entire sample can be homogeneously mixed together.

Our method of mixing the sample on the boat is by shoveling the ore from one pile to another, putting each shovelful on top of the cone until all the ore has been delivered from one pile to the other. After repeating this several times the pile is flattened out by placing one corner of the cutting edge of the shovel in the top of the cone and circling the pile. This distributes the ore evenly and at the same time flattens the cone. The flattened pile is evenly quartered and the opposite quarters are thrown out. The above mixing process is continued, and if found necessary the lump ore is crushed finer. This is done when 35 per cent. or over of the cargo is lump ore, and the last quartering, or about 100 pounds, is saved and put into cans.

The amount of ore taken for each sample before mixing and quartering depends on the tonnage sampled, and as this varies it is impossible to give the exact weight, but as a rule 45 to 55 pounds are taken from each hatch. The last two opposite quarters are taken to our crushing and drying house on the docks, weighed and dried at 212 degrees. This ore is again weighed when dry and the difference is the amount of moisture in the cargo. The sample is next crushed in a Gates crusher, thoroughly mixed as described above and about 10 to 15 pounds are sent by express to our laboratory for analysis, the sampler keeping in reserve one-half of the last quartering so that we can call for this should anything happen to the portion shipped.

The advantage in our opinion of having these drying and crushing plants on the docks is that a larger sample can be mixed in the dried and crushed state, better than the wet ore as it comes from the boat. Determining the moisture at the docks avoids all accidents that might happen to an undried sample in shipment and gives the proper percentage of moisture in each cargo on its arrival at the unloading dock.

Large Samples Advocated.

In summing up the question of sampling all grades of iron ores that are delivered at lower lake ports it is a difficult matter for us to state all conditions and variations that occur in this business. No two boats are unloaded under exactly the same conditions and no two cargoes of the same ore present the same surfaces, so that it is impossible for us to instruct our samplers in any one general rule for sampling other than what is given above, embracing the fundamental principles of sampling that we have adopted. By employing intelligent men and instructing them generally about sampling we leave the detail and conditions to their better judgment, but keeping them well under our eye and inspecting their work often.

We believe firmly in large samples and endeavor in all cases to take them. By "large samples" we mean 300 to 1500 pounds. Of course the amount depends upon the tonnage sampled, but roughly figuring the amount we should say that one-quarter of a pound per ton gives a sample that is representative. The rapidity with which boats are now being unloaded requires a constant watch on the sampler's part to be on hand to sample the ore when the worked surfaces present the best faces and those that when sampled will give an average of the entire cargo.

Before the docks installed the present fast unloading machines we used to take three rounds for each sample, sampling the ore in the boats when one-quarter unloaded and again when one-half out and a third time when three-fourths out, and mixing all three samples together for our final sample. But now the time required for unloading is so short that three rounds are entirely out of the question. We believe and have proved beyond a doubt that one large sample taken when the boat is about one-half out gives the proper analysis of the ore.

The samples received at our laboratory having been dried at the docks they need no further drying and are run through a crusher that crushes them up until the ore will pass through a 15-mesh sieve. After crushing the sample it is mixed on oilcloth by rolling and also by pouring the ore from one pile to another, opposite quarters being taken and mixed as above until about 5 ounces are left. This is placed on a chrome steel plate and bucked down until all the sample passes through a 100-mesh sieve and then thoroughly mixed by rolling. About 1

* A paper read at the Iron Mountain, Mich., meeting of the Lake Superior Mining Institute, October, 1905.

ounce of this ore is dried in a water bath at 212 degrees F., placed in a bottle and corked tightly and allowed to cool. From this dried sample all determinations are made.

Methods of Analysis.

We submit below the methods used in our laboratory for analyzing iron ore and those that are accurate and at the same time rapid:

Iron.—Weigh ½ gram of ore into No. 0 beaker; dissolve in hydrochloric acid with the addition of a small amount of stannous chloride; reduce with stannous chloride while hot; transfer to No. 4 beaker; add 10 to 15 c. cm. mercuric chloride and dilute to about 400 c. cm.; add 10 to 15 c. cm. manganese sulphate mixture and titrate with permanganate. Mercuric chloride is a saturated solution, and manganese sulphate mixture we make as follows: Dissolve 800 grams in 5550 c. cm. water, add 1650 c. cm. phosphoric acid and 1600 c. cm. sulphuric acid. Permanganate is made to have 1 c. cm. equal 1 per cent., using ½ gram of ore.

Phosphorus.—Dissolve 4 grams of ore in hydrochloric acid, evaporate to 5 or 10 c. cm., add 40 c. cm. nitric acid concentrated; evaporate to about 15 c. cm., dilute and filter; add ammonia until it sets to stiff jelly, then add a few c. cm. in excess. Redissolve with nitric acid, heat to 85 C. and precipitate with molybdate solution, made as follows: Dissolve 400 grams molybdic acid in 1600 c. cm. ammonia of 96 specific gravity and add to 6000 c. cm. nitric acid of 1.20 specific gravity. Add 40 c. cm. of this solution and shake five minutes and let settle; filter. wash with a solution of ammonium sulphate (25 grams of the crystals, 50 c. cm. sulphuric acid, 2500 c. cm. water); dissolve, precipitate in flask with ammonia (1 part ammonia, 3 of water); wash filter twice with water; add 10 grams mossy zinc and 80 c. cm. sulphuric acid (1 part sulphuric acid, 3 parts water); heat 15 minutes, filter through cotton, wash with water and titrate with permanganate, using same solution as used for iron determination—viz.: 1 c. cm. equals 1 per cent. iron on ½ gram of ore. Multiply number of c. cm. used by 0.2035; the result is phosphorus. In ores which retain some of the phosphorus in the residue this is ignited over the blast for about five minutes in crucible, then transferred to beaker and boiled with 10 c. cm., 1.20 specific gravity, nitric for five minutes and filtered into main solution.

Silica.—Weigh 1 gram of ore, dissolve in hydrochloric acid, add a few drops of nitric acid and evaporate to dryness; take up in hydrochloric acid and filter. Burn off filter in platinum crucible and fuse with carbonate of soda. Dissolve in weak hydrochloric and evaporate to dryness. Moisten with hydrochloric acid, add hot water, filter, wash with hot water and weak hydrchloric, ignite in crucible and weigh as silica.

Manganese.—Dissolve ½ to 2 grams of ore in hydrochloric, add 5 to 10 c. cm. sulphuric acid, evaporate until fuming freely; cool, dissolve in water, transfer to ½ liter flask, precipitate iron with zinc oxide suspended in water, dilute to mark and filter; measure off two portions of 200 c. cm. each and titrate each portion. Multiply number of c. cm. used by 0.1473 and divide by number of grams represented in solution. The result is manganese.

Alumina.—Dissolve 1 gram ore in hydrochloric, evaporate to dryness, take up in hydrochloric filter, fuse residue; dissolve fusion in weak hydrochloric, evaporate to dryness, moisten with hydrchloric, dissolve in hot water, filter into first filtrate, neutralize with ammonia, add 3 3-10 c. cm. hydrochloric, dilute to 450 c. cm.; add 2 grams sodium phosphate in solution, stir until solution is clear, add 10 grams hyposulphite of soda and 15 c. cm. acetic acid, 30 per cent.; let stand 15 minutes, then boil 15 minutes, filter, wash with hot water, dry, ignite and weigh as aluminum phosphate.

Lime and Magnesia.—Dissolve 1 gram of ore in hydrochloric, evaporate to dryness, redissolve in hydrochloric, dilute, filter; fuse residue with sodium carbonate, dissolve in weak hydrochloric, evaporate to dryness, cool, moisten with hydrochloric, dissolve with water, filter and wash into first filtrate; heat to boiling, precipitate iron with ammonia, filter while hot; wash several times with hot water, add a few c. cm. of ammonia to filtrate, heat to boiling, add about 10 c. cm. hot ammon oxalate, boil five minutes, let settle, filter, wash with hot water. After thoroughly washing beaker and precipitate transfer precipitate to beaker in which precipitation was made; wash filter with weak sulphuric acid, then add 15 c. cm. concentrated sulphuric acid, heat to 70 C. and titrate with permanganate used for iron determination; 1 c. cm. equals 0.0005 gram iron. Multiply by 0.2500. Result is oxide of lime.

Magnesia.—Cool, filtrate from lime; add 10 c. cm. concentrated solution of sodium phosphate and ammonia, equal to about one-tenth the bulk of solution; stir well, let stand in a cool place over night, filter, wash with 10 per cent. ammonia, ignite in porcelain crucible and weigh. Multiply weight by 0.36036. Result is magnesia.

Sulphur.—Dissolve 3 grams of ore in aqua regia, evaporate to dryness, take up in hydrochloric, evaporate a second time, take up in hydrochloric and filter; precipitate with barium chloride while hot, let settle and filter; wash with cold water and weak hydrochloric, ignite and weigh as barium sulphate. It is always best to test your acids and if sulphur is found determine amount and deduct from results.

Loss by Ignition.—Weigh 1 gram of ore in platinum crucible, heat over blast lamp about five minutes, cool and weigh. Difference is organic and volatile matter.

Revenue Legislation Prospects.

WASHINGTON, D. C., October 31, 1905.—Acting under instructions from the President, the several Cabinet officers have applied themselves to the task of cutting down their annual estimates for the purpose of obviating the necessity for revenue legislation at the coming Congress. The appropriations to be made next winter will be employed during the fiscal year ending June 30, 1907, and it is the President's hope that such retrenchment can be effected as to bring the expenditures authorized within the estimated revenues. In this way the Administration hopes not only to avoid tariff legislation, but even the revision of the internal revenue laws.

Applying the Pruning Knife.

In the execution of the President's policy Secretary Taft has applied the pruning knife to the estimates of the War Department, thereby reducing them about $9,000,000. The Secretary of Commerce and Labor has cut down the figures for his Department nearly $2,000,000, and the Secretary of the Interior has made a similar reduction. The Secretary of the Treasury and the Secretary of Agriculture are counted upon to make a small cut in the figures now before them, but the heads of the other Departments have not yet been able to see their way clear to reducing their expenditures. The Secretary of State has already planned to ask for a larger appropriation for the consular service in the interest of the export trade of the country, and as the cost of maintaining the Department of Justice is almost altogether a matter of salaries, fixed by law, which cannot be reduced in appropriation bills, it is doubtful if anything can be saved in the Attorney-General's Department. The cost of the postal service necessarily increases with the population, and little or no economy can be effected as long as the present policy with reference to the liberal extension of the rural free delivery service is followed. The Secretary of the Navy is strongly in favor of liberal expenditures and will submit a fairly comprehensive construction project with his annual report to the President. Mr. Roosevelt has always favored a strong navy and it is not believed that this Department will be asked to reduce its figures much, if any, below those of last year.

Summarizing the efforts being made in the several Departments, it seems possible that reductions aggregating about $15,000,000 may be effected, provided Congress is not called upon to make deficiency appropriations. The important question, therefore, is whether these reductions will be sufficient to close the prospective gap between receipts and expenditures. While these calculations relate to the fiscal year ending June 30, 1907, it is interesting to

examine in this connection a memorandum prepared by Treasury experts showing approximately the condition of the Treasury at the close of business to-day. These figures show a deficit of about $14,000,000, as compared with $23,000,000 on the corresponding date a year ago, a gain of about $9 000,000. The total receipts from all sources are put down at $197,000,000 and the expenditures at $211,000,000. It is significant that the total deficiency for the fiscal year ended June 30, 1905, was almost exactly the amount of the shortage on November 1 preceding. Should this rule prevail during the current fiscal year the total deficit on June 30 next would be only about $14,000,000, or slightly less than the amount which President Roosevelt hopes to save by close paring of the annual estimates. There is, therefore, some reason to believe that by strictly enforced economy a deficiency can be averted.

Proposed Canal Bonds.

The proposed sale of $60,000,000 Panama Canal bonds to replenish the cash balance in the Treasury, a scheme that has been attributed to Secretary Shaw, is not likely to be carried through, at least with such a purpose in view. The available cash in the Treasury now exceeds $130,000,000, and with a deficit for the year that can hardly exceed $25,000,000 and may not amount to more than $15,000,000, it would certainly be unwise to issue bonds for the sole purpose of adding to the cash on hand. Such a plan is opposed even by those men who believe that the revenue laws shuld be revised in order that receipts may equal expenditures.

There can be no doubt that the anti-revision element in Congress is developing a strong movement designed not only to influence the views of the public but also to induce the President to abandon any idea he may have entertained of calling attention to the necessity for revenue reform in his forthcoming message to Congress.

W. L. C.

Is Engineering Overcrowded?

Referring to the fact that at the time of the last Federal census about 40,000 engineers were practicing their profession in the United States and that at the same time at least 15,000 students were preparing to enter the engineering field the *Engineering News* concludes that "the majority of young men now studying to be engineers must eventually find positions requiring fully as much knowledge of business as of engineering and that our engineering colleges should recognize this by giving their students better training in business methods." It adds that at present engineers as a whole are better employed and at more remunerative rates than at any time for a long period of years, though it concedes that this condition of active demand cannot be expected to be permanent. The inference carried by the statement in a recent paper by Prof. William Kent of Syracuse University that in 1903 nearly every engineering college in the country had applications for about twice as many graduates as it could furnish, and that in that year and in the present year the demand for engineers exceeded the supply, is called in question. The *Engineering News* suggests that the employer who notifies one institution that he can give positions to one or more graduates is very apt to send a similar letter to other schools, and it concludes: "The youth who is debating whether he shall spend four years in an engineering school should not form the idea from Professor Kent's statement that there are good places open for twice the engineers that the colleges can grind out. He will find that the engineering profession is a place of keen competition, a competition which has for years kept down the returns from strictly professional work to a point that has caused a large proportion of those who were formerly engaged in that work to turn aside into business ventures."

The American Situation Discussed in England.

Concurrently the question of the demand for engineers is under discussion in the columns of the *Engineer* of London. That journal comments editorially on a letter in the London *Standard* from an American engineer, who raises three points: "First, does the development of American trade demand more engineers? Second, is the training now given just what is wanted? Last, can the United States export business be so much developed that more engineers must be wanted?" The *Engineer* says that for some time doubts have been felt in the United States concerning the efficiency of the instruction in engineering given in technical colleges and schools. And, further:

> Hitherto the policy of the schools and colleges has been to train men in the principles of mechanical and physical science in the first place, and in the second to teach them something of the application of those principles in practice. It has been taken for granted that men educated in this way must be efficient engineers, who can make everything wanted from a nut and bolt to a big mill engine. Furthermore, it has been assumed that a go-ahead country like the United States cannot have too many engineers the product of technical colleges. In fact, teaching has been done much in the same way and on the same assumptions as in Germany. It is now beginning to be understood that it is quite possible to have too many engineers. It is a familiar fact that Germany is overstocked with Charlottenburg young men who can barely earn a pittance, and now much the same thing is taking place in the United States.

The point is made that in the United States firms making machinery to sell know that they have no use for the merely intellectual young man. The highest mathematical qualifications and the most profound knowledge of physics will not enable any one to make steam engines which he can sell at a good profit, nor will they enable a contractor to build a great dock and make a small fortune out of the building. As to the suggestion that the development of a foreign trade by the United States is necessary that the future engineer may have a chance the American correspondent of the *Standard* says:

> In Germany, but more especially in England, it is found that the engineer goes into every part of the world. He does this because the commerce of the country in mechanical lines has developed in every quarter. Therefore the men who pursue this work are not dependent upon local conditions or developments. On the other hand, in America it is more and more clear that the engineer other than in the mining branch finds only a restricted outside field for the exercise of his talents and is thus compelled to compete more sharply than is elsewhere the case with his compatriots.

On this the *Engineer* comments as follows:

> It is obvious that we have here something which has much to do with fiscal policy. It would be strange if the fact that more men are turned out of technical colleges than can find employment at home should result in a modification of tariffs, which in its turn would augment the export trade of the United States. Finally, we may point out that nothing has yet been said about the influences which gigantic trusts cannot fail to have on the work of the country and the demand for engineers; that is a question which demands much consideration on the other side of the Atlantic.

Great Britain's Problem Also.

From the communications to the *Engineer* on the question of the demand for engineers and its relation to the supply it would appear that the situation in the United States referred to above is not more acute than in England. Some of the correspondents consider that the demand for engineers is not at fault, but the supply. One says: "There are any number of college graduates knocking about calling themselves engineers—whether justly so or not depends on the definition of that elastic word—but that there is even a fair supply of men who are of any value to the manufacturing engineer in their present condition of mind is certainly much open to question. Certainly if there are such very few of them have crossed my path." The correspondent goes on to enumerate the qualifications needed, putting "mere knowledge" low in the scale: "In nine cases out of ten the draftsman can get everything necessary out of Molesworth and in the tenth he can ask his friends." A man who can think independently, who can manage men, who can construct machinery that can be sold at a profit, who, in short, can bring things to pass is the kind of engineer wanted. Another writer says: "The plain fact is that there are a great deal too many men seeking employment and only the pick will get what work is going." A third criticises the ignorance of costs displayed by many engineers and lack of ability to make a profit. The general impression gathered from the discussion is that the question is a very live one with British manufacturers in all lines of industry.

Recent Customs Decisions.

Concentrated Corundum Ore.

The Board of United States General Appraisers has overruled a protest filed by F. W. Myers & Co., Plattsburg, N. Y., regarding the rate of duty applicable to corundum ore concentrated. The collector of customs levied duty on the marchandise at the rate of 1 cent per pound as emery grains and emery manufactured, ground, pulverized or refined. It was maintained by the importers that the article was entitled to free entry either as emery ore or else under the provision for crude minerals. In his opinion written for the board General Appraiser Hay says that although the importers were duly notified of the time and place of hearing their protest the protestants failed to appear or submit evidence in support of their contention.

Copper Nails.

In a decision by the Board of Appraisers rendered October 27 the claim of Middleton & Co., New York, for free entry of copper nails was denied. They were assessed by the customs authorities at the rate of 45 per cent. under the provision for manufactures of metal. The importers took the view that the nails were of a character to be comprehended under the provision for "old copper," which is free of duty under the tariff. Another claim for exemption was that the merchandise was fit only for remanufacture. The board deems both of these allegations as without merit.

Small Magnets.

On October 27 the Board of Appraisers promulgated a decision sustaining a protest by Wagner Bros. & Co., New York. It appears that the collector demanded duty at the rate of 45 per cent., as manufactures of metal, on certain small magnets imported by the firm. It was insisted by the importers that the merchandise should be considered toys, with duty 10 per cent. less than that returned by the Custom House authorities. Considerable testimony favorable to the importers was placed before the board, and General Appraiser Fischer finds that the New York firm's contention is well taken and should be sustained. The collector is ordered to reliquidate the entries in accordance with the finding of the Customs Court.

Mallets Made of Raw Hide and Metals.

In a decision written by Mr. Fischer the Board of Appraisers has refused to reduce an assessment made by the collector of customs at Chicago on mallets which the appraiser reports to be composed of raw hide and metal, raw hide chief value. It seems that duty was assessed on the mallets at the rate of 45 per cent. as articles not specially provided for, composed in part of metal. While several claims for a lower duty were made by the importers the board overrules all of the protests.

Steel Buttons.

The board has adjusted a dispute between Collector Stranahan and the importing firm of A. & H. Veith, New York, concerning the classification of steel buttons. The goods were assessed at the high rate of 50 per cent., whereas the importers maintained that the correct rate should be three-quarters of 1 cent per line gross and 15 per cent. ad valorem. General Appraiser Sharretts decided that the collector's action was illegal and directed that official to reliquidate the entries at the lower rate.

Parts of Agricultural Machines.

The International Harvester Company was defeated on Monday before the Board of United States General Appraisers in an attempt to have an assessment of duty on parts of agricultural machines reduced. The collector of customs at Chicago levied duty on the parts at the rate of 45 per cent. as manufactures of metal. In order to obtain possession of the machines the duties demanded by the collector were paid and an appeal was filed with the Customs Court. When the case came before the tribunal the importer set up the claim that the articles were "agricultural implements" and as such dutiable at only 20 per cent. In overruling the protest General Appraiser Fischer states that the provision in the tariff for agricultural implements does not include parts of machinery.

Metal Plates for Embossing.

The board on Monday denied a claim made by G. W. Sheldon & Co. of Chicago regarding the rate of duty applicable to metal plates used for embossing. They were considered to be manufactures of metal, with duty at the rate of 45 per cent. The importers, however, insisted that the articles should pay only 20 per cent. as lithographed plates. In a special report the appraiser stated to the board that the articles are ornaments of brass used in the process of embossing. As the importers offered no evidence in support of their allegations the board sustains the action of the collector in demanding the higher duty.

Malleable Annealing Without Pots.

A method of annealing malleable castings in the open oven without the use of pots has been developed by Wm. L. Casaday of the W. L. Casaday Mfg. Company, Incorporated, South Bend, Ind. The annealing oven may be of the usual construction for the most part, the distinctive feature of Mr. Casaday's invention being the interior arrangement, under which the malleables are packed together in a mass with scale, and flues run through the oven, connecting with the flues in the side and end walls. As the malleables are packed in the oven, flues are laid so as to divide up the mass of castings and scale. These flues carry the fire through the contents of the oven, causing it to heat up evenly and quickly. It is possible to examine the interior flues at any time to see that all parts are heating evenly and all flues are controlled by dampers for regulation of the draft. The flues in the side walls communicate both with the source of heat and with the specially laid removable flues, the latter being supported in and extending through the castings and scale. The interior flues also communicate at each end with the vertical flues at the ends of the oven.

The results of tests made to determine the comparative economy of this method and the ordinary procedure in which pots are employed are presented in the following cost statement:

Cost to Anneal 18,000 Pounds of Iron in Pots.

12½ tons coal, at $2.90	$36.25
5090 pounds of pots and bottoms, at $17 per ton	43.26
66 hours at 14 cents per hour, to pack pots	8.24
25 hours at 14 cents per hour, to set pots in oven	3.50
4 hours at 14 cents per hour, to brick up oven	.56
90 hours at 14 cents per hour, to take pots out of oven and empty and deliver to rattlers	12.60
Cost of firing oven	11.20
Total	$115.61

or 64 1-5 cents per 100 pounds.

Cost to Anneal 25,165 Pounds of Iron Without Pots in Same Oven.

24 hours at 15 cents per hour, for packing and covering	$3.60
22 hours at 14 cents per hour, for packing and covering	3.08
3 hours at 15 cents per hour, for bricking up ovens	.45
48 hours at 48 cents per hour, for emptying and delivering to rattlers	6.72
5 hours at 14 cents per hour, for handling mud or sand	.70
50 bricks burnt up or broken, at $27 per 1000	1.35
10 tons coal, at $2.90 per ton	29.00
Cost of firing oven	7.84
Total	$52.74

or 21 cents per 100 pounds.

The malleables annealed in these tests were poured from cupola iron and required a higher heat in annealing and its application for a longer time than is the case with air furnace malleables. Such a high heat would burn up pots rapidly and waste a considerable amount of iron. The tests above reported were made on the same oven, the one set before and the other set after remodeling in accordance with the new method. It will be seen that an increase of 39 per cent. in capacity was made possible by doing away with annealing pots. The Casaday oven has been in use for nearly two years at the plant of the South Bend Chilled Plow Company, South Bend, Ind.

THE IRON AGE

1855—1905.

New York, Thursday, November 2, 1905.

DAVID WILLIAMS COMPANY, - - - - - - - PUBLISHER
CHARLES KIRCHHOFF, - - - - - - - } EDITORS
GEO. W. COPE, - - - - - - - - } EDITORS
A. I. FINDLEY, - - - - - - - - } EDITORS
RICHARD R. WILLIAMS, - - - - - - - - HARDWARE EDITOR

The Chance of the Engineer.

The recent discussion in the columns of engineering journals on both sides of the water, of the gist of which some idea is given elsewhere in this issue, raises some interesting questions as to the adequacy of the courses now laid out for engineering schools. While some of the considerations urged by participants in the discussion are rather for those who control the destinies of the various engineering colleges, one point made will appeal strongly to manufacturers. It is that a knowledge of business quite as much as the knowledge of engineering is more and more required of the graduates of technical schools. This brings up at once the question of the extent to which engineering courses are providing training in business methods.

When the United States Steel Corporation sent letters to the presidents of the technical schools of the United States two or three years ago asking their co-operation in giving the pick of their graduates a chance in the service of the corporation this point was made: The men wanted by the corporation in its operating departments are "such as are practical in their judgment and have a plentiful supply of common sense; men of brains and ambition who are disposed to devote their energy to industrial lines; men with potential energy and originality." It was plainly set forth that men whose chief recommendation was the attainment of high term grades were not of the kind sought. And in one form or another in the recent discussion referred to above, as in all the periodic discussions of the place of the engineer in modern industrial economy, the point continues to be made that the man strong in theory but with no large equipment of ability to bring things to pass will find plenty of competition as he seeks a place in which to turn his education to account. It has been asserted so often that it has become hackneyed that Germany's advance industrially has been largely due to the prominence given to technical education there and to the contributions of her engineers to the minute economies of manufacturing processes. And now we are told by one writer who considers the supply of engineers to be quite in excess of the demand that to-day Germany is overstocked with Charlottenburg young men who can barely earn a pittance.

It certainly has not come to such a pass in the United States in spite of the addition every year of about 3000 young men to the ranks of technical school graduates. We can scarcely take seriously the suggestion in the columns of an English contemporary that the export trade of the United States must be developed more vigorously so as to furnish an outlet for an overstock of engineers. In view of the testimony from Great Britain and Continental Europe the American engineer may well prefer to face the situation at home than fly to evils that he knows not of in the world's market for engineering talent.

Concerning the influence of consolidations on the demand for engineers in the United States data on which to base a judgment are not sufficient. Many of the things that were predicted of the United States Steel Corporation in its curtailment of opportunity for employment have not been realized. At least there have been compensations. In the opportunities its many sided operations offer in connection with the possibilities of transfer from one field to another it gives better promise of all around development than was afforded by the old *régime*. That its engineers can undertake experiments which would be out of the question for the ordinary organization, because of the expense, has proved of distinct advantage. And so far as the demand for engineers is concerned, the corporation's officials have repeatedly been quoted to the effect that the one need that will always exist is a need of the right kind of men to be in training for the places of those who are responsible for affairs to-day.

Probably the chief value of the whole discussion will be in the light it may throw on the question whether the training now given in engineering schools is just what is wanted.

Coke and Ore Prices for 1906.

The question of the cost of coke after January 1, 1906, and of ore after the opening of navigation next year has been forced upon the attention of the Northern merchant furnaceman in an emphatic way in recent weeks. Furnace companies that have their own iron and coal mines and their own coke ovens have been selling pig iron freely for the first quarter and to a less extent for the first half. Furnaces depending on the market for both ore and coke have more of a problem in connection with such sales. Some have bought coke for the first half and a few for the entire year. A considerable percentage have still to buy and are not pleased at the prospect of paying $3 or more at the ovens. It has been intimated that important interests, deprecating the rapid rise in coke and interested in holding all prices within bounds, might change the policy followed in recent years and become sellers at a figure that would relieve the situation. No evidence of such selling appears as yet, though, as has been the case heretofore, trading of coke for pig iron may still be expected. Authoritative denial is made in this connection of the report that the leading coke producer has contracted for the entire output of important works in the Connellsville region. Furnacemen have found their problem by no means simplified by the car troubles that have come with the heavy fall movement of freight and that point to increasing difficulty in the winter season. Yet there is a distinctly expressed unwillingness to tie up at an advance of 100 per cent. for coke over the contract prices of last fall and contribute to the present tension by establishing pig iron costs on high levels for months to come.

The ore situation shows signs of greater conservatism than has prevailed thus far in respect to coke. One of the few merchant ore firms at Cleveland is understood to have offered its ore for next year at an advance of 25 cents over the basis of 1905. Most sellers of Lake Superior ores are disposed to postpone consideration of contracts for 1906. The point is made that May 1, 1907, when such contracts would terminate, is eighteen months off, and that is a long look ahead. Much can happen meantime, and considering the present aspect of the iron trade and its history the possibility that a still higher price for 1907 would be warranted by conditions a year from to-day is not seriously entertained. Furnacemen have been inquiring, however, and want some basis on which to make sales for the first half of 1906. All such will have to decide between the minimum advance of 25

cents now talked of and one of 50 cents, which it is argued in some quarters may yet prove to be the ore miners' proper share in the advances in other lines. For Mesaba non-Bessemer ore, for example, which sold early this year at $3 for a 60 per cent. ore with 12 per cent. of moisture, $3.50 has been proposed as the 1906 price. Such an ore reached $3.15 after the early sales this season, so that the advance would be in reality 35 cents from a basis established in 1905. On other ores the advances are to be compared with $3.20 for the old range non-Bessemer base ore this year, $3.50 for Mesaba Bessemer and $3.75 for old range Bessemer.

If only 25 cents advance is made on Lake Superior ores for 1906, and $3 at ovens is made the basis for the coke contracts yet to be closed, the advance would be $2 a ton over to-day's cost at most Central Western furnaces. That would mean a cost of about $15 a ton for a well equipped furnace in the Mahoning and Shenango valleys. It can be appreciated that at such a figure the merchant furnaceman is not eager to sell far into the future at the prices recently prevailing.

Progress in Machine Tool Design.

Until the advent of high speed steels the standard types of machine tools had remained practically unchanged for years. The changes that followed were mainly modifications, such as increasing the proportions of parts and providing greater power. One innovation, which was principally an outcome of the availability of tools of higher capacity, was the introduction of mechanical change gear devices for variable speed drive. The last two years have seen the bringing out of many forms of such devices. With these exceptions there have been no radically new features in the universal machine tools, by which are meant engine lathes, planers, milling machines and drills. This in spite of the fact that there was never more talent devoted to the development of machine tool design than at present. The inference is plain. These tools have so nearly reached perfection that there is little left to be desired along their lines, and naturally effort may be more profitably directed toward the producing of special tools for which a demand now exists.

The notable tendency of modern machine shop practice is toward the more extended use of what are known as "single purpose" machines, or machines specially designed for single operations. Their range of work is necessarily limited, but this is a sacrifice of little account in comparison with the advantage of greatly increased producing capacity. Turret lathes, boring mills, shapers and screw machines are a few tools of this class that are already familiar, and in another part of this issue is described a recent addition called a low swing lathe, which is adapted only for work of small diameter turned on centers, but is capable of handling it with extreme rapidity. The use of such machines offers a very satisfactory and efficient solution of the problem of securing greater output. Many of the wide range machines were originally designed for conditions that no longer exist, and to continue to use them even in their perfected forms for work that would be as well or better handled by a simpler and cheaper tool is ill advised. The new conditions of greater volume of work warrant its division into smaller classes, each requiring machines having only a small range, and this enables the builder to improve the arrangements for control of the work and tool and to eliminate the features that are unnecessary except to a universal machine.

Immigrants Needed in the South.

In the South to-day there is a scarcity of labor that is unprecedented. As a matter of fact the agricultural and industrial development in the South for the past five or six years has entirely outstripped its labor supply. Ten or fifteen years ago the cheap labor in the South was its great boast. There was a time in the Birmingham district when particular stress was laid on the cheapness of labor, and not only on the cheapness of the labor but its docility and willingness. However, that has all changed now. Practical experience has conclusively shown that while some colored men are as good and faithful laborers as white men, yet these are the exception. The Southern colored man is naturally not a mechanic, nor is he a miner, but he is a child of the soil and prefers work in his own cornfield or his own cotton patch to anything else. For five years the South has been blessed with abundant crops, cotton has brought high prices and the result has been that gradually the colored population has been drawn away from industrial centers into the country. There has been no influx of white laborers to take the place of the negroes and to-day the situation in all Southern industrial centers is serious. Twenty thousand Italians, Huns or Poles could be used to good advantage in Birmingham alone this fall. Not only that, but they could find permanent places, and it is probable that the South could absorb this number of immigrants year after year for a considerable time to come. Undoubtedly the very necessities of the occasion will presently bring immigration to the South. Yet it is a curious fact that there is a latent spirit of hostility all through the South and even in the Birmingham district to imported labor. There is a feeling that the purest Anglo-Saxon stock in the country is to be found in the South and that immigration of the present kind will gradually deteriorate the Southern blood. Some of the Southern newspapers refer to the danger that Southern ideals of exclusiveness would encounter if a flood of immigration was turned loose upon them. This purely sentimental view of the situation can have very little weight in the long run, however much present influence it may exert.

By-Product Coke in the Northwest.

The constantly increasing consumption of by-product coke in the foundries of the Chicago and Milwaukee districts represents a noteworthy change from the sentiment against the use of this product which prevailed in the Western foundry trade a few years ago and which still exists in sections where necessity has not compelled a trial of it for melting iron in the cupola. The erection of 80 by-product ovens at Milwaukee with a view to disposing of the bulk of the coke for foundry use was considered a bold undertaking, to say the least, as experts then differed widely as to the availability of retort coke for foundry use. Inability to secure regular shipments from Connellsville and West Virginia fields owing to inadequate transportation facilities furnished an opportunity for the coke produced "close at home." Experiments showed results equal to and often better than were secured with beehive coke and the insurance of a constant supply, owing to the short haul, established its use almost immediately in many plants. To-day this coke is sold on a parity with the delivered price of the high grade product from Eastern fields and the supply is already inadequate to the demand. At Chicago 120 by-product ovens are nearing completion, which in addition to supplying the demand for domestic fuel will seek

a further outlet in the foundry trade. At Milwaukee the existing by-product plant is to be doubled and in the not distant future the use of Connellsville and West Virginia cokes may even be the exception in the Western foundry trade. The bulk of the coal used in these retort ovens is shipped from the Connellsville and adjoining fields and by the aid of lake transportation the all-rail rate is reduced fully 25 per cent.

Western merchant furnaces are also adopting by-product coke as a fuel, its limited supply alone having militated against its use in the burden of two Wisconsin stacks without the admixture of Eastern coke. Upon the completion of the additions to the Milwaukee plant these furnaces will use by-product coke entirely, and it is probable that one stack in Chicago will receive its fuel from the plant nearing completion there. The furnace of the Detroit Iron & Steel Company, as is well known, has been working on by-product coke from the first. The experiments carried on at Detroit have demonstrated satisfactorily that a good furnace coke can be made in retort ovens and at the same time a maximum yield of by-products be secured if the coals are carefully mixed and the coke carefully made. At Detroit West Virginia and Virginia coals have been used, with a small admixture of Pittsburgh district coals. The Detroit plant, at first 60 ovens and supplying the foundry and domestic trades exclusively, was increased to 120 ovens when the erection of the blast furnace was decided upon. The experience with the foundry trade tributary to Detroit has been similar to that at Milwaukee—an entire removal of the early reluctance to use by-product coke. The first unfavorable impressions were due very largely to the appearance the coke had as the result of quenching outside the oven. Where proper care is taken in the choice of coals and in the operation of the ovens. structure and content are such as to meet fully the foundryman's requirements.

CORRESPONDENCE.

The Lürmann Cinder Tap.

To the Editor: The Lürmann cinder notch was tried at the Thomas Iron Company's plant, the Crane Iron Company's plant and at Plymouth Furnace. It was abandoned by all of them.

When Edward Cooper of Cooper, Hewitt & Co., New York, designed the Durham Furnace, which was blown in in 1876, he put in the Lürmann notch. This consisted of three parts—the bottom plate with water coil cast in it, the hood resting on the bottom plate with water coil cast in it, and the cinder notch consisting of a block of cast iron with the coil cast in it, leaving a hole of 1½ inches for the cinder to flow through. This notch set in under the hood at the inner end. The furnace had no fore hearth and the apparatus was placed in the crucible walls as is done to-day.

The furnace was a large one, using lean ore mixtures and making a large volume of cinder. The cinder soon burned the cast iron off the notch, leaving the coil bare. The cinder then broke out over the outer end of the notch and the coil was soon burned, requiring frequent renewals of the notch. New notches were put in when the cast iron around the hood coils melted off, leaving the cinder break out between the coils of the hood. A new hood was put in and the cinder broke out between the coils of the bottom plate. The notch was abandoned, the opening was closed with clay and the cinder was tapped through the clay. This involved stoppage of the blast and large quantities of clay to bot up the hole after each flush of cinder.

The furnace became scaffolded and was blown out after a short blast of two months. It was repaired and put in blast at once. Taws & Hartman, Philadelphia, made the following changes: A large coil breast with the coil wound close together was built in the wall on the outside, a short intermediate bronze breast was placed in the inner end of the large coil breast and in the inner end of the intermediate breast was placed the bronze cinder notch. This arrangement worked well, the greater cooling surface in the bronze breast and notch and coil wound closely in the large outside breast giving a more powerful cooling effect, with no opportunity of the cinder melting through between the coil. This arrangement was also applied by Taws & Hartman in 1879 at the Carnegie Furnaces, Pittsburgh, and is now in general use at all furnaces. It was the first practical application of bronze notches.

THE HARTMAN COMPANY.

PHILADELPHIA, October 27, 1905.

In the communication from F. Firmstone on the above subject, printed last week, "high blast furnaces" should have read "high blast pressures."

British Steel Output First Half of 1905.

Statistics gathered by the British Iron Trade Association show that the total output of Bessemer steel ingots in Great Britain in the first half of 1905 was 1,019,887 gross tons, against 865,683 tons in the first half of 1904 and 911,670 tons in the first half of 1903. The output of acid Bessemer steel was 698,836 tons and of basic Bessemer 321,051 tons. The production of open hearth steel ingots in the first half of 1905 was 1,980,095 tons, as compared with 1,670,129 tons in the first half of 1904 and 1,639,239 tons in the first half of 1903. The output of open hearth steel consisted of 1,627,698 tons of acid and 352,397 tons of basic. This compares with 1,326,882 tons of acid open hearth and 343,247 tons of basic open hearth in the first half of 1904. The production of Bessemer steel rails in Great Britain in the first half of 1905 was 540,314 tons, as against 523,771 tons in the first half of 1904.

The increased steel production for the first six months of this year as compared with the corresponding period of last year is attributable to the prosperity of steel manufacturers in the United States and Germany, which has caused a lessening of shipments from both those countries into Great Britain. The same rate of production kept up through the balance of this year would give a total of 5,999,964 tons of Bessemer and open hearth steel for Great Britain, which compares with 5,026,879 tons of ingots in 1904.

Commenting on the improved conditions in iron and steel in Great Britain the London *Iron and Coal Trades Review* says: "The whole industrial situation is full of satisfactory and reassuring features. The outlook has rarely been more entirely favorable. An opportunity seems now to be opening up which will enable the British steel industry to make a more solid and substantial advance than it has done for a number of years, and this not in one department only, but in many."

Four triple-web plate girders, weighing 108,000 pounds each, were recently transported in Chicago about a mile, from the freight yards at the foot of Water street to the Majestic Theatre. Each girder has a length of 41 feet, a width of 3.5 feet and a depth of 7 feet. A wagon of special construction was required to handle them, it having 925-pound wheels with wooden spokes, 5½-inch steel axles and 1½ x 6 inch tires. In order not to interrupt the heavy street traffic the haulage was done only at night. It was found that a period of one and one-half days was required for the unloading and hauling of each one of the girders. Six men did the unloading, while 16 horses were required for the heaviest grades and 12 for the passage along level ground. The unloading was performed by means of greased T-rails in conjunction with the customary equipment of jacks, skids and cribbing.

The new blast furnace built on the American scale and with American equipment at the Cleveland works of Bolckow, Vaughan & Co., Middlesbrough, England, has been blown out for repairs. It was started in May of this year.

Punching and Reaming Structural Steel.

A supplemental report on punching and reaming has been issued recently by the American Railway Engineering and Maintenance of Way Association's Committee on Iron and Steel Structures and is published as Bulletin No. 66 of that association. The report presents details of an interesting investigation conducted by the committee into the effect of punching and reaming, this question having always furnished its full share of grounds for difference between engineer and steel manufacturer. The last preceding report of the committee was made in 1903. It was based in part upon a complete series of tests conducted at Edge Moor, Del., upon soft steel and in part upon steel of a higher grade than that now in use. To bring the subject up to date the committee set out to make tests upon open hearth steel of structural and medium grades.

It was decided to secure samples of both acid and basic open hearth steel with ultimate strengths of 60,000, 65,000 and 70,000 pounds per square inch and thicknesses of ⅜, ½, ⅝ and ¾ inch, and to have this material made up into test specimens with both sheared edges and planed edges with no holes, and having planed edges, with a central hole rough punched, subpunched and reamed, and drilled from the solid. At least three specimens of each kind were taken in order to eliminate as far as possible irregularities of results. It was decided to make all the specimens 3 inches wide and 16 inches long, and all holes were to be 15-16 inch diameter. All the samples of the same quality and thickness were to be cut from a single plate, and the usual tests and chemical analyses from the heats the plates were made from were to be recorded. The Carnegie Steel Company furnished the basic samples and the Pennsylvania Steel Company the acid samples. The samples were broken by the Pittsburgh Testing Laboratory. Concerning the heat treatment of the acid steel in rolling the Pennsylvania Steel Company wrote the committee as follows:

> This steel was all rolled into 4 x 10 inch slabs in a universal mill at Central Iron Works. If we had used narrow flats rolled on grooved rolls in a structural mill I think the material would show far more uniform than these tests in question, as it has always been our experience that the wider you make the plates the greater variation in tensile strain. The mill treatment was normal in the case of the plates ⅜ inch thick, and ⅝ inch and ¾ inch with 60,000 ultimate, and the ½ inch and ⅝ inch with 65,000 ultimate, and the ¾ inch with 70,000 ultimate. The others were rolled a trifle hot.

The Pittsburgh Testing Laboratory made the following comments concerning its tests:

> *Basic Steel.*—All sheared specimens began to tear on one edge first, and gradually opened until final rupture, giving in many instances a very irregular but silky fracture. All punched specimens showed several openings around the edge of hole near fracture, due to roughness of hole. The reamed and drilled specimens gave a very gradual pull, while the punched ones broke with a sudden jerk.
>
> *Acid Steel.*—All sheared specimens (except those that broke granular) showed small openings around edge of hole near fracture, due to roughness of hole. A few specimens broke granular on one side first, while the opposite side of hole gave silky fracture. Several of the ⅝ and ⅞ inch specimens broke granular before I could record exact ultimate, and broke with a sharp (snapped) sudden report, but you can see that they are high grade specimens. The reamed and drilled specimens of the high grade steel all over ⅝ inch gauge all broke granular, with a sharp, snappy report; several snapped off shortly after recording the elastic limit.

The Committee's Conclusions.

As a result of the tests the committee feels warranted in drawing the following conclusions:

1. Punching holes or shearing edges in structural steel according to our specifications has the effect of slightly reducing the ultimate strength, very largely reducing the ductility at the hole, and slightly increasing the elastic limit.

2. Of the 138 samples (sheared and punched) broken, not one indicated an effect until strains greater than the elastic limit were reached.

3. Granular fracture appears to be more frequently produced in acid than in basic steel.

4. The effects upon stretch, ultimate and elastic limit do not seem to be any greater in cases of granular fracture than in others.

5. The effects of punching and shearing upon the character of the fracture are somewhat more marked as the thickness increases, the exact limit of thickness where reaming is necessary, however, not being established at ⅝ inch or any other particular thickness. Thickness appears to have little or no effect upon strength or ductility.

6. The effects of shearing and punching are wholly removed by planing and reaming concentrically.

7. There is fully as much necessity for planing sheared edges as reaming punched holes.

8. The difference in elongation between finished and rough holes seems large, but if we consider that failure in a member of a riveted structure would undoubtedly occur at one point with no stretch except at the weakest point, the ductility of the member as a whole would not be seriously affected.

The Question of Annealing.

The tests in question did not go into the question of annealing. The tests at the Edge Moor Bridge Works, referred to above, demonstrated that in soft steel all effects of punching could be removed by annealing. The opinion has been held also that driving a hot rivet in a hole and allowing it to cool would anneal the metal sufficiently to have the same effect. The committee, however, presents in a table the results of some tests made for the Boston Transit Commission at the Watertown Arsenal in December, 1904. The steel from which the test samples were made was open hearth, and rolled under a specification similar to that of the Maintenance of Way Association. The samples were 3 inches wide, with planed edges. The effect of the punching corresponds with that of the committee's tests referred to above. But the riveting, it was shown, did not have any appreciable annealing effect.

In connection with the effect of punching the committee devoted some thought to the subject of the size of the die with reference to the size of the hole. Heretofore the association's specification has required that "the diameter of the punch shall not be more than 1-16 inch or that of the die ⅛ inch larger than the diameter of the rivet." This provision has been found to be impracticable. The committee says: "There seems to be no doubt that where the metal is so crowded as to produce the double shearing effect it must be more seriously injured than where the burr comes through with a single shear, and, moreover, it leaves a hole which is so ragged that it is much less practicable to fill it by upsetting the rivet. While it is not desirable to specify the exact size of the die it is well enough to put a limit on it, and the only thing that is necessary is to put this limit so that an inspector can insist on it and see that it is not exceeded. For this reason the committee has decided that clause 33 should be amended so that it shall read as follows:

> "When general reaming is not required the diameter of the punch for material not over ⅝ inch thick shall not be more than 1-16 inch greater than that of the rivet. The diameter of the die shall not exceed the diameter of the punch by more than one-quarter the thickness of the metal punched. . . .
>
> "The effect of this wording is to allow a 1-16 inch clearance for ¼-inch metal and ¼ inch for metal 1 inch thick, if punching were allowed in so thick metal, but limiting the thickness to ⅝ inch the maximum clearance would be 5-32 inch, which is just about right for smooth punching."

Berlin is to have a metropolitan subway, the length of which, according to present accepted plans, will be 18.6 km. (11.5 miles). The estimated cost is more than $12,000,000, which figures out at upward of $1,000,000 per mile. The third-rail system has been adopted and sufficient power will be installed to enable the trains to make a speed of 25 miles per hour. The cars, which are of the standard American pattern, with central passage, are to be divided into first and second class compartments and will be well lighted, as will also the underground stations. Special attention has been paid to the problem of proper ventilation and the tunnel is to be provided with ample exit facilities in case of accident.

Youngstown as a Railroad Center.*

BY JAMES P. WILSON.

Our city lies midway between Cleveland and Pittsburgh, near enough to each to increase as they increase, but far enough away to be dwarfed by neither. We lie directly in the pathway, almost in the center, of that great highway of traffic, the internal gulf stream of commerce which surges between the Atlantic seaboard and the Mississippi. We assemble here at a minimum cost the fuel and the ore material, and we produce in prodigious quantities those articles of commerce which, next to food and clothing, the world needs most.

Great Trunk Lines Run Through the Valley.

The result has been that, attracted by our tonnage, the great trunk lines from east to west all converge with their heaviest freight carrying lines into and through our narrow valley, so that at one point within the limits of this municipality and within a width of 200 feet the Lake Shore and its valuable possession, the Pittsburgh & Lake Erie, the Baltimore & Ohio, the Erie and the Pennsylvania run side by side with their double and quadruple tracks like well trained draft horses yoked together in a common cause. Their branches, side tracks and special service tracks extend with great facility into all of the extensive plants in the Youngstown district, so that there is no large manufacturing plant within our boundary which has fewer than two of these systems directly connected with its plant; many of them have three and a few of them have all four of these railroads entering into their local yards. Meanwhile the Wabash system has acquired an entrance into the city, purchased and paid for a valuable right of way extending from the southern limits of the city into the heart of the manufacturing district, ready for construction at any time. Another independent system of railroad extends from the city southward, and still another, which for obvious reasons shall not be named at this time, is rapidly acquiring a right of way through that district of our city where the tonnage is the heaviest. The Lake Erie & Pittsburgh is running its survey from a connection with its Lorain-Cleveland line into and through Youngstown.

Railroad Companies Hardly Keep Pace with Traffic.

It is no vainglorious boast to say that there is no city of equal size in the United States which surpasses Youngstown in its unexampled railroad facilities. Nay, more; while there is railroad trackage running into and through this city capable of carrying the tonnage of any ordinary city of half a million inhabitants yet so great has been our demand for freight, so vast the tonnage production of this district within the past five years, that the railroad companies entering this valley have been hard put to it to keep pace with our enormous demands for transportation. In fact, all of the railroad companies entering this city have been obliged either to rebuild their lines substantially or to double their capacity. The Lake Shore & Michigan Southern Railroad Company has built a double track road devoted to freight alone from its great ore docks at Ashtabula into the city of Youngstown. The Pittsburgh & Lake Erie Railroad has its four-track system rapidly approaching completion extending from this city to Pittsburgh, and in our suburbs has established a classification yard of 40 parallel tracks, which is already pushed to its capacity in making up and classifying north and west bound freight. The Baltimore & Ohio at enormous expense has built a double track through the heart of the city, completed during the present year, which reaches the city of Akron to the west with an almost perfect alignment. A great many millions have been expended by the Erie Railroad in bettering its transportation facilities and yards in Youngstown and between here and Cleveland, and the Pennsylvania, which was perhaps less prepared than any to sustain the enormous increase of traffic, has spared neither money nor pains to make its traffic facilities adequate to the enormous demands upon it.

It will be neither a novel nor a startling statement to those who are best informed when I say that from a point at the northern outskirts of Youngstown to a point 10 miles east of Pittsburgh the railroad freight tonnage is the heaviest in the known world. Nothing in Manchester or Birmingham in England can be compared with it.

Enormous Tonnage of the Youngstown District.

I have certain data which may not prove uninteresting so far as they can be comprehended. From a careful computation I speak advisedly when I say that a very conservative estimate reveals the fact that the tonnage of the Youngstown district, including the inbound and outbound freight, of iron and steel alone in this city, including of course the tonnage upon the raw material, the fuel, coal, coke and the finished product, amounts to 11,000,000 tons per year. This does not include the vast through freight traffic from the coal measures of Pennsylvania passing directly through our city for lake shipment nor the ore passing through it to the Pittsburgh district nor any through miscellaneous freight, but is confined solely to the product of iron and steel.

One railroad company alone, including the local and through freight, sends to us a daily average of 1200 loaded cars of freight, aggregating 48,000 tons, and carries outbound about the same number of loaded cars daily, the tonnage of which, being mostly finished product, is of course not so great, but exceeds 16,000 tons. This road in one month brought into this district for the manufacture of iron and steel alone from 400,000 to 500,000 tons and carried out over 110,000 tons. If the loaded cars of freight coming into this city and passing out of this city daily on one road alone were coupled together they would make a train 9 miles long each way. And if all the loaded cars of freight brought into this city or carried out of it in a single year were coupled end to end they would make a continuous train of loaded freight cars extending from Youngstown to San Francisco and back again. A consideration of these figures makes it unnecessary for me to speak of the enormous motive power necessary to move and shift so vast a tonnage, not to speak of the tens of thousands of cars which move in almost endless procession through our city. While our growth has been phenomenal in the past, it has ceased to be a prophecy and it now becomes a mere matter of calculation that before this century is ten years old the city of Youngstown will contain within its limits a population of over 100,000 people.

* Address delivered October 23 before the Youngstown Credit Men's Association, Youngstown, Ohio.

Two 7500-kw. steam turbine generating units are to be the forerunners of ten such units in the new Waterside station No. 2 of the New York Edison Company. The sets measure each 50 feet in length, 17 feet in breadth and 15 feet in hight, the floor space thus required per 1000-kw. rated capacity being 113 square feet and the over all volume per kilowatt 1.7 cubic feet. This forms a very compact set, and the space required for auxiliaries is further much decreased by the use of the expedient of placing the surface condensers beneath the turbines in the foundations proper. Operation will be under a steam pressure of 175 pounds per square inch, with 100 degrees of superheat and a vacuum of 28 inches of mercury, the normal speed of the unit being 750 revolutions per minute. Each unit is to be capable of bearing without undue heating an overload of 50 per cent., at which the turbine will be developing no less than 15,000 horse-power, the largest yet achieved by a single unit on land, though this figure is surpassed by several marine engines.

It is proposed to erect in the center of the Indiana coal fields a large power plant for the generation of electricity which is to furnish all the power needed for the traction lines of the central and southern parts of the State. Those interested in the project claim that the power can be so generated and transmitted to substations by electric lines more cheaply than the coal can be carted to the present stations and burned in separate plants. The first installation is expected to be in the neighborhood of 10,000 horse-power and the estimated cost is about $1,000,000.

The Steel Corporation's Quarterly Report.

At the regular quarterly meeting of the directors of the United States Steel Corporation, held in New York on Tuesday, October 31, the statement for the quarter ending September 30, 1905, was presented and the dividend of 1¾ per cent. on the preferred stock was declared, payable November 30. The earnings for the third quarter of the fiscal year were reported to be $31,240,582 and the total of unfilled orders on hand October 1 was announced to be 5,865,377 tons. The detailed statement for the quarter is as follows:

Net Earnings.

July, 1905	$9,035,168	
August, 1905	10,986,901	
September, 1905	11,218,513	
Total net earnings after deducting, each month, the expenditures for ordinary repairs, renewals and maintenance of plants, also interest on bonds and fixed charges of the subsidiary companies		$31,240,582
Less appropriations for the following purposes:		
Sinking funds on bonds of subsidiary companies	$535,135	
Depreciation and reserve funds (regular provisions)	5,558,781	
Special depreciation and improvement fund	1,232,172	
		7,326,088
Balance of net earnings		$23,914,494
Deduct:		
Interest for the quarter on U. S. Steel Corporation bonds outstanding	$5,745,696	
Sinking funds for the quarter on U. S. Steel Corporation bonds—viz.:		
Installments	$1,012,500	
Interest on bonds in sinking funds	178,766	
	1,191,266	
		6,936,962
Balance		$16,977,532
Dividend for the quarter on preferred stock, 1¾ per cent.		6,304,919
Surplus for the quarter		$10,672,613
Less, appropriated from surplus for the following purposes—viz.:		
On account of expenditures made and to be made on authorized appropriations for additional property, construction and discharge of capital obligations	$4,000,000	
Specifically set aside for contemplated appropriations and expenditures	2,500,000	
		6,500,000
Balance of surplus for the quarter		$4,172,613

W. J. FILBERT, Comptroller.

The net earnings by quarters this year as compared with those for the corresponding quarters of 1904 are as follows:

	1905.	1904.
First quarter	$23,025,096	$13,445,232
Second quarter	30,305,116	19,490,726
Third quarter	31,240,582	18,773,932
Totals	$84,570,794	$51,709,890

On the basis of an estimate that the earnings in October, November and December this year will average up to the $11,218,513 recorded for September, the earnings for the fiscal year will be close to $118,000,000. The total for 1904 was $73,176,521; for 1903 it was $109,171,152, and for 1902 it was $133,308,763.

The total of unfilled orders on the corporation's books on October 1, 5,865,377 tons, compares with 5,597,560 tons on April 1, 1905, the largest total previously reported. On July 1, 1905, the total was 4,829,655 tons.

By the use of a special plenum heating system and coke washing apparatus the offices of the H. K. Porter Company, in the heart of the Pittsburgh mill district, are being provided with clear, fresh air, which has made it easy to keep clean the papers and drawings which were formerly rendered very dirty by the dust and soot which so heavily permeate the atmosphere. The washer consists of a metal supporting frame filled with coke, over which water is allowed to trickle. The air in passing between the fragments of coke is denuded of its cargo of smoke and dirt, which are carried by the water to the bottom of the apparatus and there removed. The slight pressure due to the indrawing of air in large quantities through this device makes it impossible for air to get in from any other point, while the continual escape of the air through all crevices tends to maintain an efficient circulation and ventilation.

The Portsmouth Steel Company.

The large plant of this company, located at Portsmouth, Ohio, has started up in full after a shutdown of nine months, during which period it has been practically rebuilt and a very large amount of new equipment installed. Included in this is a battery of new Stirling water tube boilers comprising four units of 380 horsepower each. A new power house has been built, in which has been installed a 250-kw. Westinghouse generator direct connected to a Harrisburg engine. The length of the main mill building has been increased to 620 feet by 175 feet 6 inches wide, in which have been installed two modern electric cranes built by the Morgan Engineering Company, Alliance, Ohio; also a new 28 x 60 inch jobbing mill, upon which can be rolled unannealed and blue annealed acid and basic open hearth steel sheets in gauges from No. 12 to 18 inclusive, in widths up to 54 inches and any lengths up to 168 inches. This mill has an annual capacity of over 12,000 gross tons.

The company has also installed a new three-high 30 x 84 inch plate mill, built by Mackintosh, Hemphill & Co., Pittsburgh, with feed and cooling tables complete; also Hilles & Jones straightening rolls and plate shears, together with a 44 x 60 inch Mackintosh, Hemphill & Co. Corliss engine of 2000 horse-power capacity. This mill will roll plates from ¾-inch thick down to No. 12 gauge, in widths up to 72 inches and any lengths up to 45 feet. It has an annual capacity of over 60,000 gross tons. Two of the open hearth furnaces have been rebuilt, giving a total capacity of steel ingots of nearly 100,000 gross tons per year. There has also been installed a new blooming mill shear for cutting slabs 30 inches wide by 6 inches thick, built by Mackintosh, Hemphill & Co. The total cost of the improvements and additions made by the Portsmouth Steel Company will aggregate over $350,000, and it now ranks among the leading producers of the heavier gauge sheets and plates.

Engineers' Trip to Sharon.

Brief mention was made in these columns last week of the excursion tendered by Mackintosh, Hemphill & Co., Pittsburgh, to the Engineers' Society of Western Pennsylvania, on October 28, to the Carnegie Steel Company's Works, South Sharon, Pa., to inspect the large blowing engines built at these works by the above mentioned firm. More than 400 persons availed themselves of the opportunity of inspecting these engines. A brief description is as follows: Diameter of high pressure cylinders, 30 inches; diameter of low pressure cylinders, 60 inches; diameter of air cylinders, 60 inches; stroke of all cylinders, 72 inches; revolutions per minute, 60; total weight of each engine, 800,000 pounds; fly wheels, each 25 feet in diameter, 40 tons weight; number of engines, 6; installed, 1903; aggregate horse-power, 14,000. Each engine discharges 30,000 cubic feet of free air per minute at a normal blast pressure of 17 pounds per square inch, with an initial steam pressure of 150 pounds per square inch, running at 60 revolutions per minute. The blast pressure can be increased to 25 pounds per square inch and the revolutions to 70 per minute in case of emergency. Among the special features of these engines may be mentioned the massive bed plates, which are continued the full length of the engines; three eccentrics for independent adjustment of valves, a very important feature, recognized by all advanced engineers; simplicity of construction and a minimum number of wearing parts; straight lines in all principal movements, thus obviating strains, which heretofore have existed in engines of this type; water jacket blast cylinders. All parts are easy of access for adjustment or repairs. The steam and blast cylinders have independent connection to the main bed plates, giving absolute freedom for expansion and contraction.

Aerostation.

BY S. D. V. BURR.

During the past few years the science of aerostatics has been studied by two distinct classes of investigators pursuing widely different paths. In the first the foundation idea has been static equilibrium as exemplified in the balloon, which provides levity to such an extent as to raise and support in the air a serviceable weight. Since the days of the Montgolfiers, who made the first ascent in 1783, aerial navigation with the aid of a balloon has remained at an absolute standstill, if we except the improvements that have been made in the envelope and rigging. A little investigation would show that this rather sweeping statement is true. The early notion that there were upper currents of air moving always in the same direction and that these could be utilized by floating in them until the desired locality had been reached and then dropping out has long been exploded. The movement of the air in the upper regions in large areas is now accepted to be as variable as it is upon or near the surface.

The dirigible balloon has not yet appeared and it is well known and appreciated that it never will appear unless we find a confinable gas infinitely lighter than hydrogen. A balloon having a capacity of 100,000 cubic feet of gas will lift something like 3000 pounds and be 40 odd feet in diameter. To move this bulk at any useful speed through a medium like the atmosphere would require tremendous power. But providing the power would not be the most serious part of the question. Maxim in his experiments with aeroplanes constructed an engine weighing less than 7 pounds per horse-power. The greatest difficulty would be caused by lack of strength of the balloon itself. Forcing such a structure through the air at any desirable rate, 10 miles or over, would most assuredly result in its own destruction. Providing adequate strength would decrease the lifting power to such an extent as to completely destroy the efficiency.

Nevertheless experiments are being made, both here and in Europe, with the balloon as the central figure. Only a few days ago press dispatches announced that the French War Office, which has always taken a deep interest in aerostatics, had made a successful flight from Toul to Nancy and that "the distance covered was about 30 miles, at the rate of 28 miles per hour." This may all be perfectly true, but like most dispatches of this character important data have been omitted. We know absolutely nothing of any importance in regard to the flight of that balloon nor of the speed it actually made. Essential data lacking are the speed and direction of the wind and the direction in which the balloon traveled. A balloon may move 10 miles per hour floating in the air and yet remain stationary as far as the earth is concerned. Both speed conditions remaining the same, a balloon may go 40 miles an hour with the wind and make a retrograde movement of 20 miles an hour trying to make way against the wind. Balloons have provided sustension above the surface of the earth, but they have never furnished progression in a desired direction at a useful rate.

The other class of investigators have worked along aeroplane paths, in which sustension depends primarily and solely upon progression. While the study of the structure of birds and observance of their action in flight have added somewhat to our knowledge of the subject we are still lamentably ignorant as to the real reason why a bird can fly at all. There is but one single characteristic common to all flying creatures—the up and down movement of the wings. The form of the bird, shape of the wings and material of which they are constructed differ in every instance. What we consider essentials hold no place. The heaviest birds do not always have the largest wings, neither are the swiftest flyers those that move their wings most rapidly. Some will rise directly from the ground with a load; others must have a previous motion in order to benefit by the lifting force of the air before they can take flight. This is accomplished by the bird running along the ground, paddling along the surface of the water or by taking advantage of a wind by rising against it or by availing itself of gravity by dropping from a hight. All yield the same result—the flow of the air against the wings, which amounts to the same as the bird's passage through the air. But no matter what their shape, they all move "edge to the wind," so to speak.

The orthogonal theory, which supposed that the reaction produced by the downward movement of the wings was equal to the weight, has been disproved. Since the bird cannot, except perhaps in the case of the humming bird and those capable of vertical ascension, maintain itself in the air by the action of its wings alone it remains to ascertain where the extra sustaining power comes from.

We all know that a sheet of tin thrown horizontally in the air will take a long time before it strikes the ground. We also know that the greater the speed the longer the flight. Professor Langley proved that, the weight remaining the same, the force required to sustain inclined planes in horizontal motion diminished as the velocity increased. He found that 1 horse-power rightly applied will sustain over 200 pounds in the air at a horizontal velocity of about 45 miles per hour, and still more at yet greater velocities. The supporting areas of birds average less than 2 square feet per pound of weight, the duck being the smallest, having only 0.44 square foot to the pound, and the swallow and lark being among the largest, having over 3 feet to the pound. It therefore appears to be apparent that if the proper curves can be kept in perfect trim or balance aerial flight should be possible with the power now at our command. In a series of very beautiful experiments Bertelli has lately demonstrated that thin sheets curved approximately on the lines of a bird's wing will move against a horizontal wind and will also lift. In all tests upon a large scale the stumbling block has been to preserve the equilibrium. Lilienthal had comparatively little trouble in making flights of several hundred feet, the impetus being obtained by running down hill, and yet he came to his death through inability to keep his machine in balance. Up to the present time all machines constructed on the aeroplane idea have encountered the same trouble. That future trials will reveal the secret is more than probable. Once the proper form is secured and balance made possible the high speed flying machine is assured.

The question is one that is receiving serious attention both here and abroad. For many years so-called "aero" clubs have been in existence in England, France, Germany and Italy, and within the past few days one was incorporated under the laws of New York. All seek the same object—the promotion of aerial navigation. The subject is not treated as a pastime, but is earnestly worked at by men of the highest ability.

The Illinois Steel Company, Chicago, has prepared plans for a big addition to the finishing department of its rail mill at South Chicago. Two buildings will be erected at a cost of $50 000 and the present hot beds will be doubled in size. Punching machines, hot saw, &c., will also be added. While the estimated capacity of the rolling mill is close to 90,000 tons a month, the output has always been limited on account of the inability of the finishing department to dispose of the rolled material. By increasing the finishing capacity it is believed that the output next year will easily reach 700,000 tons.

A new development in electric welding is the automatic production of continuous rolls of wire fencing. A number of galvanized wires are fed from reels arranged vertically and parallel to each other, and from another reel placed transversely to these are cut off lengths of wire which are fed horizontally across the vertical wires. Where the horizontal and vertical wires intersect they are welded together by means of small transformers. The welded section then moves forward a predetermined distance and the operation is repeated.

PERSONAL.

John H. Neary, who has been chief engineer of the Federal Building at Milwaukee, Wis., has resigned his position to become superintendent of construction of the Crane Company, Chicago.

James W. Wallace, president of the Central Trust Company, New York, has been elected a director of the Pressed Steel Car Company to succeed the late George S. Macklin. John H. Regan has been elected assistant secretary.

F. P. Jones has been appointed general manager of the Dominion Iron & Steel Company, Sydney, Nova Scotia, to fill the vacancy made by the resignation of Graham Fraser, director of works. Mr. Jones has heretofore acted as general sales agent for the company and is thoroughly acquainted with the different departments of the works.

S. S. Knight, who has been general manager of the Birmingham Pipe & Casting Company, Birmingham, Ala., for the past five years, resigned his position October 23 and became connected with Abendroth Brothers, Port Chester, N. Y., November 1.

Dr. L. Héroult, Jean Lejournet and R. Euenhull, all of France, have recently been in Syracuse, N. Y., for the purpose of superintending the installation of the Héroult electric steel making system in the new plant of the Halcomb Steel Company.

F. A. Austin, superintendent of the Erie Traction Company, Erie, Pa., has severed his connection with that company and accepted a position with the Erie Foundry Company as manager of its machinery sales department.

A. L. Lovejoy, manager of the Becker-Brainard Milling Machine Company, Hyde Park, Mass., has returned from a two months' trip abroad, undertaken with both business and pleasure in view.

It is announced that Willard P. Ward, vice-president of the Distillers' Securities Corporation, has succeeded James H. Hyde, who recently resigned from the directorate of the Colorado Fuel & Iron Company.

Dr. William B. Phillips, recently head of the Geological Survey of Texas, goes to Terlingua, Brewster County, Texas, to open quicksilver mines for the Chisos Mining Company. Dr. Phillips was connected for a number of years with the Tennessee Coal, Iron & Railroad Company.

J. W. Duntley, president of the Chicago Pneumatic Tool Company, will sail for Europe next Tuesday for an extended business trip.

E. A. S. Clarke, president of the Lackawanna Steel Company, announces that C. H. McCullough, Jr., was elected a vice-president and the general manager of the company at the meeting of the directors on October 26. Mr. McCullough's title heretofore has been assistant to the president. His headquarters will be at the works at Buffalo, N. Y., as they have been for some time.

OBITUARY.

SERENO T. MERRILL, prominent as a manufacturer and promoter of worthy local enterprises, died at Beloit, Wis., October 22, aged 89 years. He was born in Massachusetts and located at Beloit in 1846, at the age of 30. In 1851 he erected the first paper mill built on Rock River. In 1872 he purchased an interest in the property now known as the Beloit Iron Works and became president and treasurer of the company. He was also president of the Eclipse Wind Mill Company, now the Fairbanks-Morse Mfg. Company. He served his city and State in a number of official capacities. He is survived by a widow and five children.

CAPT. JOHN E. WHITE, for a number of years a partner in the Boston metal house of Richards & Co., died in Worcester, Mass., October 25, aged 62 years.

ARTHUR BYRON CAPEN, sales agent for the Pittsburgh territory for the Babcock & Wilcox Company, died from heart disease October 27 at the Hotel Manhattan, New York, aged 44 years. He was born in Mattoon, Ill., and became connected with the Babcock & Wilcox Company when a very young man. He is survived by a widow.

JAMES W. PEARCE died at Cleveland, Ohio, October 29, aged 63 years. He was born in London and went to Cleveland over 40 years ago, being employed first by Lord, Bowler & Co., as a draftsman. He became a partner, and since 1900 had been sole proprietor. He was also proprietor of the Cleveland Elbow Company.

The Chicago Railroad Rate Conventions.

As a result of the clash between the opposing delegates to the convention of the Interstate Commerce Law League, held in Chicago October 26 and 27, there was organized a rival body, to be known as the Federal Rate Regulation Association, whose members emphatically protest against the investiture of railroad rate making authority upon any appointive body such as the Interstate Commerce Commission. The Interstate Commerce Law League, on the other hand, adopted resolutions supporting the utterances of President Roosevelt regarding the regulation of railroad rates and will urge upon Congress the enactment of legislation which will give the Interstate Commerce Commission power to regulate unjust or discriminating tariffs. Representative shippers and accredited delegates from commercial organizations, numbering over 800 and representing every section of the country, gathered to attend the convention called by E. P. Bacon of Milwaukee, chairman of the Interstate Commerce Law League. Before the convention assembled it developed that the opposition was of sufficient numerical strength to defeat the supporters of Federal control of railroad rates, and to prevent the possibility of circumventing the purpose for which the meeting was called it was decided to compel delegates to subscribe to the following extract from the President's last message to Congress:

> The Interstate Commerce Commission should be vested with the power, where a given rate has been challenged and a full hearing found to be unreasonable, to decide, subject to judicial review, what shall be a reasonable rate to take its place, the ruling of the commission to take effect immediately and to obtain unless and until it is reversed by the court of review.

The opposition, led by David M. Parry of Indianapolis, chairman of the National Association of Manufacturers, upon refusing to accept this pledge was denied admission to the convention hall as delegates, and a convention apart from the regular one was thereupon called and a platform adopted diametrically opposite to that of the Interstate Commerce Law League. Charges were freely made that the opposition was fostered by the railroad interests, but were not entirely sustained, as many of the most prominent shippers and manufacturers in the country attended the so-called "rump" convention.

A summary of the platform adopted by the convention called by E. P. Bacon of Milwaukee is as follows:

> Congratulations to President Roosevelt for his stand relating to rate legislation, commendation to the House of Representatives for co-operating with the President and urging that the Interstate Commerce Commission be vested with power to fix substitute rates for any railroad rates successfully challenged, said rates to prevail unless reversed by the court of review.

E. P. Bacon was continued as chairman of the Executive Committee of the league and the sum of $10,000 was subscribed by the delegates for propaganda work, and a committee was appointed to visit President Roosevelt and inform him of the action of the convention. The Federal Rate Regulation Association adopted a platform which recognizes the evils of existing conditions, but opposes any effort to grant power of rate regulation to the Interstate Commerce Commission. A summary of its resolutions is as follows:

> Recognizing existing evils connected with the transportation interests of the country—namely, all forms of rebate or favoritism extended to one individual or locality to the disadvantage and detriment of others or affected through private car lines, industrial, terminal or switching lines, manipulation of freight classification, unfair and unequal distribution of freight classification or by any other or different means—we demand the most rigid enforcement of the law, which, if found to be inadequate, should be so amended as to provide speedy, efficient and permanent relief.

A permanent organization was effected by the election of N. W. McLeod of St. Louis as president. Other officers, including secretary, vice-presidents representing every State and Territory in the Union, and 12 vice-presidents-at-large have been provided for.

NEWS OF THE WORKS.

Iron and Steel.

By an accident at the plant of the Struthers Furnace Company, Struthers, Ohio, on October 25 a quantity of molten metal was precipitated into a pit. An explosion that followed killed two men and wrecked the entire pouring end of the pig iron casting plant. The intention has been for some time to blow out the furnace for relining, and in view of the accident operations were stopped at once, and a new lining will now be put in. The furnace had been in steady operation for exactly a year with the exception of one interruption of a day or two.

The new 36-inch blooming mill of the Harrisburg Pipe & Pipe Bending Company, Harrisburg, Pa., will be started this week.

The No. 1 and No. 2 plate mills and universal mill of the Central Iron & Steel Company at Harrisburg, Pa., made a product of 3478 tons of steel plates week before last, breaking the record for the plant, although this has been a very busy year.

The Middletown, Pa., works of the National Tube Company are preparing to start two more furnaces at the works. The plant has had a busy fall, and there are now over 900 men at work at that place.

The Jones & Laughlin Steel Company, Pittsburgh, Pa., is building a 26-inch structural mill to be driven by two Corliss engines, which are being built by the C. & G. Cooper Company, Mount Vernon, Ohio. The roll train will be furnished by Mackintosh, Hemphill & Co., Pittsburgh, and the mill tables, hot bed, shear tables, &c., by the Morgan Engineering Company, Alliance, Ohio. The cold saws and shears are being made by the United Engineering & Foundry Company, Pittsburgh.

Topton Furnace of the Empire Steel & Iron Company, Topton, Pa., was blown in October 28, after an idleness of several months.

Repairs on the Sheridan Furnace, at Sheridan, Lebanon County, Pa., are being rushed.

The Iroquois Iron Company, Chicago, has purchased 23 acres of land having a frontage of over 1700 feet on Lake Michigan, at South Chicago. The property includes a line of tracks known as the Chicago & Calumet Terminal Railroad, which connects these tracks with the trunk line railroads passing through South Chicago. This property, while not adjoining that owned by the company at South Chicago, and on which its two blast furnaces are located, is connected with the latter by means of the terminal railroad acquired. A new blast furnace, plans for which are now being prepared, and which will have a daily capacity of about 300 tons, will be located on this property. In addition to the big frontage on Lake Michigan the property has a small frontage on the Calumet River, and a slip intervening will permit of the unloading of ore carriers at the furnace docks.

As a result of a serious gas explosion at the furnace of the Marting Iron & Steel Company, Ironton, Ohio, on October 25, the furnace is now out of blast. The rigging was blown off the top of the furnace, the bell was blown out of place and a good part of the contents of the stack was expelled. The company has all the materials for repairs on the ground or in sight and expects to have the furnace in blast again by the end of this week. It produces the "Nellie" brand of iron.

A new company is being organized at Youngstown, Ohio, to manufacture tool steel and it will probably occupy the plant of the George B. Sennett Company in that city, which has been idle for some time. Among those interested are E. L. Brown, Walter A. Beecher, J. Craig Smith and others.

The Kittanning Iron & Steel Mfg. Company, Kittanning, Pa., has bought about 100 acres of coal lands near Kittanning upon which a number of coke ovens will be built to supply its blast furnace with coke.

General Machinery.

Bantam Anti-Friction Company, manufacturer of roller and ball bearings, at Bantam, Conn., advises us that it has recently added new machinery to its equipment, but with these additional facilities is still obliged to run nights to fill orders. This company is under the management of W. S. Rogers, well known in the ball bearing field.

At a meeting of the stockholders of the Geneva Foundry & Machine Company, Geneva, Ill., officers were elected as follows: President, H. B. Fargo; vice-president, Gus Soderstrom; treasurer, John T. Peterson; secretary, Frank Channon. The company has commenced the erection of a one-story building 50 x 100 feet. As yet no machinery for its equipment has been purchased.

The United Iron Works Company, Springfield, Mo., has secured an order for the entire equipment for a large coal mine to be opened at Calgary, British Columbia.

The City Machine Company, Cleveland, Ohio, has let contract to C. H Fath & Son Construction Company for the repair of its building, which was recently damaged by fire. The building is seven stories, 60 x 90 feet, and the improvements involve an expenditure of about $16,000. A Niles-Bement-Pond 6-foot drill is being installed as well as a 4-foot boring mill and some other small tools.

The Standard Machinery Company, Norwalk, Ohio, which has been in operation for some time with O. M. Brown as president and W. H. Wilson as manager, will remove to Bowling Green, Ohio, having secured a site in the latter city on Pike avenue at the crossing of the Toledo & Ohio Central Railroad. At Bowling Green Messrs. Brown and Wilson will be joined by J. C. Slocum, who has been connected with the Jeffrey Mfg. Company, Columbus, and who will add a number of lines to the business of the Standard Company, which has heretofore consisted principally in the manufacture of bolt cutters and lathe die stocks. Mr. Slocum will endeavor to develop hoisting engines for use in small factories. A factory building, 50 x 150 feet, will be erected and placed in operation by January 1. Machinery for its equipment has not yet been decided upon.

The Buick Motor Company, which operates two plants, one at Flint, Mich., where the engines, transmissions and other mechanical parts of the automobiles are made, and the other at Jackson, Mich., where the automobiles are assembled, will move its assembling factory to Flint to bring it in closer touch with the manufacturing plant. Nothing has been done as yet regarding the power and machinery requirements of the new assembling plant.

The Southern Machine Works, High Point, N. C., G. H. Wilson and J. H. Burns, proprietors, has erected a new building, 30 x 60 feet, and is now engaged installing the equipment. Besides the manufacture and repair of machinery the firm will carry a full line of mill supplies.

The W. R. Demster Machinery Company, Kansas City, Mo., has incorporated for the purpose of extending its business and opening in connection a salesroom for the Maxwell automobiles and supplies. The company has been engaged in gear cutting and general machine work, cast iron brazing and the manufacture of the Barr-Fyke post-marking machine and the Barr Mining & Machine Company amalgamator.

The New Process Raw Hide Company, Syracuse, N. Y., has announced its intention of going more extensively into the manufacture of metal gears of all kinds as well as its well-known New Process noiseless pinions. In furtherance of this plan the company has just completed a two-story brick addition containing about 10,000 square feet of floor space and is installing a number of additional turret lathes, drills, grinders, spur gear cutters, bevel gear planers and other machinery necessary for the manufacture of accurate gearing. This additional equipment will increase the company's capacity about 75 per cent. Business with this company is very brisk, and it reports shipments as considerably in excess of last year, with prospects very bright for a continuance of same.

The Association for Mechanical Development has been organized and has purchased a four-story building 50 x 230 feet in Philadelphia, Pa., which we understand is to be used for the manufacture of mechanical apparatus. Wilber C. Brown, 30 Broad street, New York, is at the head of the enterprise.

The Dicke Tool Company, Downers' Grove, Ill., expects to buy some additional machinery for its plant as soon as the buildings are completed. The company recently purchased considerable machinery, but will need machinery for turning poles tapering from 2½ to 2 inches, in length from 12 to 22 feet, also a forge machine and a machine to punch eyes in hammers.

The Landis Machine Company, Waynesboro, Pa., will hold a meeting on December 14 to vote on a proposed increase of capital stock from $50,000 to $100,000.

The North Birmingham Forge Company, North Birmingham, Ala., which was incorporated last July, has completed the erection of an iron frame manufacturing building, 125 feet square, and power house 25 x 70 feet, in which it has installed an up-to-date equipment purchased through the Birmingham Agency of the Crane Company, Chicago, including Williams & White drop hammers and Bradley trip hammers. The company has a number of orders in hand for turnbuckles, cable car grips, thumb screws, thumb nuts, valve stems for gasoline engines, &c. Besides these products it manufactures drop forgings of all kinds. J. H. Minge, Jr., is president; J. W. Sloss, secretary and treasurer, and W. E. Nichols, manager.

The Jones & Laughlin Steel Company, Pittsburgh, has placed an order with the Dayton Pneumatic Tool Company, Dayton, Ohio, for 30 No. 3 Green chipping hammers. The concern has also received an order for 38 similar hammers of miscellaneous sizes for shipment to Japan.

The Riverside Foundry & Machine Works, Riverside, Cal., is rebuilding its plant which was recently destroyed by fire. The new building will cover floor space of about 200 feet square. The company will use electric power and expects to equip its plant with individual motors.

Bridges and Buildings.

M. Rabbitt & Sons Company, Toledo, Ohio, has received contract for the erection of the new bridge plant of the Toledo-Massillon Bridge Company. The contract price is $40,000. The plant will be erected during the fall and winter, its completion being planned in time to begin operations in the spring.

The City Council, Portage, Wis., will receive bids until November 7 for the construction of the superstructure of a steel highway bridge across the Wisconsin River, consisting of four 160-foot spans.

The Joliet Bridge & Iron Company, Joliet, Ill., was awarded contract at $2962 for the erection of six steel bridges near Stillwater, Okla.

The Insley Iron Works, Indianapolis, Ind., recently incorporated with a capital stock of $15,000, is completing a new shop, 40 x 140 feet, on the Belt Railroad, which will be equipped for structural and ornamental iron work. The company expects to have the machinery in operation about November 1. W. H. Insley is president; E. F. Knefler, secretary and treasurer, and Louis F. Eichhorn, superintendent.

The Bartlett Steel Company, Joplin, Mo., whose structural iron and steel plant was destroyed by fire some time ago, has broken ground for its new shop, which will be 70 x 100 feet and will be completely equipped with modern metal working machinery, all of which has been purchased. The building will be a steel frame ironclad structure.

Foundries.

The L. W. Pond Machine & Foundry Company, Worcester, Mass., is to extend its foundry by an addition 50 x 70 feet.

Christian Brown, who has for the past three and a half years conducted a brass foundry at 52 Garden street, Bridgeport, Conn., has completed a new building at 46-48 Garden street, in which the foundry business will be continued and equipment has been added to finish castings, including grinding, polishing and buffing. All the new machinery has already been ordered.

The Columbiana Pump Company, Columbiana, Ohio, is increasing its facilities by the erection of a foundry, 80 x 100 feet.

The Keeler Brass Company, Grand Rapids, Mich., is excavating for an addition to its foundry, which will be two stories, 60 x 140 feet, and will be used as a machine and pressroom. While no additional power machinery will be purchased, the company will need shafting, pulleys and similar equipment.

The Astoria Steel Plant, Astoria, L. I., has been sold to Augustus Van Horne Ellis of 82 Wall street, New York, for $80,000. The plant, which is well equipped for the manufacture of steel castings, is for sale.

W. B. Cook & Co., iron and brass founders, Winston, N. C., have done an encouraging business at Greensboro, where they established a branch foundry 60 feet square the early part of the year. The building is situated on the tracks of the Southern Railroad.

The Mitchell & Van Meter Company, manufacturer of plumbers' brass and iron material, Linfield, Pa., has purchased a site at Pottstown, about 275 x 350 feet, and has commenced the erection thereon of a two-story brick building 40 x 120 feet, which will be used for the manufacture of plumbers' brass castings. This new plant will be run in addition to the company's iron foundry at Linfield, which it will continue to operate. The company is in the market for a 50 or 60 horse-power upright boiler and a 50 horse-power engine.

Power Plant Equipment.

The Allis-Chalmers Company recently shipped from its West Allis plant a 9000 horse-power steam turbine engine to the Brooklyn Rapid Transit Company, where it will form a part of the street railway power plant of that company. It is the first turbine engine ever sent from the Allis-Chalmers works for commercial purposes. The electric generator for the engine is being made at the Cincinnati plant of the company.

The plant and business of the Lyons Engine Company, Lyons, Mich., have been purchased by C. R. Herrick, who for some time has had an interest in the company. The company manufactures gasoline engines.

The Havana Mfg. Company, Havana, Ill., has filed articles of incorporation with a capital stock of $24,000 to manufacture gasoline engines and appurtenances. The incorporators are B. H. and G. C. McFadden, Geo. T. Fish, H. McHenry and J. H. Watts.

The municipal electric light plant at Tompkins and Delancy streets, New York, was put in operation on Monday. This plant will be operated by rubbish collected throughout the city and will be used for lighting the Williamsburg Bridge.

During the week ending September 29 the Westinghouse Companies, East Pittsburgh, Pa., received orders from the Toledo Gas, Electric & Heating Company, Toledo, Ohio, for two 1000-kw. turbo generator sets; Pennsylvania Railroad, four 500-kw. turbo generator sets; Water, Light & Gas Company, Hutchinson, Kan., two 500-kw. turbo generator sets; Solvay Process Company, Syracuse, N. Y., one 500-kw. turbo generator set.

The Westinghouse Machine Company, East Pittsburgh, Pa., has within the past few weeks booked orders for more than 75 steam engines aggregating 10,764 horse-power. Of the different types 5040 horse-power were of marine engines, 2740 horse-power of compound steam engines, 1823 horse-power of standard engines, 801 horse-power of Junior engines and the remainder Corliss engines. The largest single order during this time was received from the Tahuantepec Railroad of Mexico for four 16 and 34 x 16 inch marine type engines and two 8½ x 8 inch standard engines for equipping its power houses at Salina Cruz and Coatzacoalcos. The orders booked from foreign countries include Kure Arsenal, Japan, one 16 and 34 x 16 inch marine type vertical cross compound engine; Furukawa Western Bureau, Japan, one 11 and 19 x 11 inch compound steam engine; Hokkaido Tanko Railroad Company, Japan, one 13 x 12 inch standard steam engine; Kiuskiu Railroad of Japan, two 10 and 18 x 10 inch compound steam engines; Imperial Printing Office of Japan, one 14 and 24 x 14 inch compound steam engine; Graham Brothers, Stockholm, Sweden, one 9 and 15 x 9 inch compound steam engine; Rio de Janeiro Tramway, Light & Power Company, Brazil, one 18 x 16 inch compound steam engine; Santa Cecelia Sugar Company of Cuba, one 18 x 16 inch standard steam engine. Orders were received from the following concerns in this country: Chicago, Milwaukee & St. Paul Railroad, Chicago; Lawrence Machine Company, Lawrence, Mass.; Pennsylvania Railroad, Wilmore, Pa.; Muncie & Portland Traction Company, Portland, Ind.; International Steam Pump Company, New York; Vesta Coal Company, Pittsburgh; Gray Mfg. Company, Gastonia, N. C.; Home Light, Heat & Power Company, Springfield, Ohio; Erie Railroad Company, Great Falls; Old Dominion Railway, Baltimore, Md.; Sidney Electric Company, Sidney, Ohio; Waltham Gas Light Company, Waltham, Mass.; Lumberton Cotton Mills, Lumberton, N. C., and American Car Heating Company.

Fires.

The Davis & Farnum Iron Foundry, Waltham, Mass., was damaged by fire last week with a loss of $10,000.

The plant of the Central Mfg. Company, Connersville, Ind., was recently destroyed by fire. The loss is placed at $100,000. The company manufactures bodies for automobiles and buggies.

The plant of the Utah Fuel Company, Sunnyside, Utah, was destroyed by fire October 27. The loss is about $200,000.

The iron foundry of the Fred Barker Company, Paterson, N. J., was burned October 27.

The forging department of the McKay Chain Works, at McKees Rocks, Pa., was recently damaged $50,000 by fire.

Hardware.

Martin & Martin, manufacturers of stove and shoe polish, Chicago, are building a three-story addition to their plant, 54 x 150 feet in dimensions, together with a power plant 20 x 50 feet. The machinery being installed is of a special character, built after designs furnished by the firm.

The Great Central Steel Range Company, Louisville, Ky., is the new company which has been formed for the manufacture of steel ranges. The company will make a full line of these goods of different grades.

The Brown-Manly Plow Company, Malta, Ohio, has added to its plant several large buildings and increased its equipment of shearing and punching machinery, also installing a power hammer for forging and plating. The second and third floors of one of the new buildings will be devoted exclusively to the making of flexible wood lever harrows.

Adams Steel & Wire Works, Joliet, Ill., manufacturer of woven wire fencing, slat fencing, corn cribs, bale ties, bone cutters, &c., is increasing its facilities for making woven wire fence, and next spring expects to double its capacity.

The Ohio Cultivator Company, Bellevue, Ohio, has purchased the business of the Bissell Chilled Plow Works, South Bend, Ind., and the entire line of goods formerly made at South Bend will be hereafter manufactured at Bellevue. The Ohio company is now completing a foundry 80 x 300 feet, which will be equipped with all the modern appliances. In addition to making its own gray iron castings the company expects later on to equip this foundry with furnaces and will turn out its own malleables. The grinding and polishing room will also be overhauled and extended to take care of the additional business.

The Arcade Mfg. Company, Freeport, Ill., has purchased the buildings and lands of the H. D. Bently Estate, adjacent to its own property. This purchase includes a three-story factory building with a piece of land 180 x 440 feet. The holdings of the Arcade Company now cover 8 acres of land and 100,000 square feet of floor space devoted to manufacturing purposes. The demand for its line of coffee mills, spring hinges, toys and hardware has been greater this year than at any year in the history of the company.

Miscellaneous.

A chair factory is to be built at Hartford, Vt., to take the place of that recently destroyed by fire. M. L. Hadley is interested in the project.

The Lally Patent Column Company, 151 Congress street, Boston, Mass., is to erect a new factory at Cambridge, Mass., to be 56 x 96 feet, two stories and basement. The building will be devoted to the manufacture of Lally's patent columns for use in building, for supporting purposes.

The Bigelow Carpet Company is to make large additions to its plant at Lowell, Mass.

The Southern Lead Company, Chattanooga, Tenn., which was recently organized by N. I. Mayes, B. N. Tarver, J. H. Arty, C. L. Covington and J. R. Morgan, for the purpose of developing lead mines in Bradley County, Tenn., will erect a smelter and has purchased the following mining and mill machinery: One battery of boilers, 320 horse-power; one Norwalk air compressor, furnishing 1100 feet of air per minute; ten Rand, Ingersoll-Sargeant and Shaw air drills; Lidgerwood hoisting engines for each shaft, and Joplin style, Hartz jigs, built at an expense of about $14,000, handling about 150 tons of ore daily. The company still requires a small furnace for lead smelting, about 20 to 30

tons capacity daily, and a small lead press for making lead pipe up to 3 inches for plumbers' supplies. Other mills are being built in the same district, and the company expects that the coming year will produce fully enough to give ore for a 30-ton smelter. W. D. Ham is general manager.

The Cascade Coal & Coke Company, an affiliated interest of the Buffalo & Susquehanna Iron Company, Buffalo, N. Y., is building 200 additional coke ovens at Tyler, Pa. This will double the capacity of the Tyler plant. A new coal washing plant is also being erected. The coke from Tyler which has been shipped to the furnaces at Buffalo has proved of excellent quality, running 88 to 89 per cent. of fixed carbon and low in alumina, with sulphur 1 per cent. and under.

The Kilby Frog & Switch Company, Birmingham, Ala., is now building a plant at North Birmingham for the manufacture of railroad crossings, frogs, switches and other railway equipment. The plant will be operated by electricity, equipment for which has already been purchased.

The Continental Engine Company, Fisher Building, Chicago, has incorporated with a capital stock of $10,000 to manufacture and sell machinery, automobiles and automobile parts. The incorporators are John E. Pfeffer, Harris F. William and Frank Pfeffer.

The Printers' Chase & Machine Works, 43 South Canal street, Chicago, has been incorporated by Swan J. Vernstein, Claus R. Peterson and John Flaherty.

David G. Cooper, Terryville, Conn., manufacturer of oven thermometers, whose factory was burned September 20, has begun the erection of a new brick factory, 33 x 58 feet and one story, and a storehouse 15 x 20 feet. In the meanwhile he is manufacturing in a room of the Andrew Terry Company's works. Mr. Cooper saved about 5000 thermometers from the fire and has since manufactured 3000, but is still behind his orders, for the first time since 1888. He expects to move into his new building in about three weeks.

The Acheson Siloxicon Articles Company, recently incorporated in Maine, has broken ground at Niagara Falls, N. Y., for an experimental plant. This is to be located on Buffalo avenue adjoining the office of the International Acheson Graphite Company, and is designed to take care of all experimental work during the winter. It is located with reference to a permanent plant to be erected next spring. The Acheson Siloxicon Articles Company will take the crude siloxicon and put it in the form of brick, crucibles, retorts and muffles of special shapes that may be required.

The Middletown Car Works, Middletown, Pa., has just received a large order for cars for the Norfolk & Western Railroad Company. They are for 1906 delivery.

The Penn Limestone Company has been chartered with a capital of $15,000 and offices in Reading, Pa. It has secured several valuable tracts in that section and will furnish limestone to furnaces. It has secured the land from which the Empire Steel & Iron Company quarried stone and will develop it fully.

S. R. Bailey & Co., Amesbury, Mass., builders of carriages, have established a department for the manufacture of automobiles. All parts of the machine, including the engine, will be manufactured by the firm, excepting certain fittings for the variable gears. No machine tool equipment is required at present, but the company states that if the business grows as expected iron working machinery will be needed, including special machines for boring small engine cylinders. At present the automobiles and engines are being manufactured in the same departments with the company's carriages.

The Middletown Chain Company has been formed at Middletown, Pa., by J. W. Rewalt, president; H. A. Clark, secretary, and H. H. Shellenberger, treasurer. The company will operate a plant in the foundry building in that place built by the Champion Novelty Company, having purchased rights to use the patent of J. C. Little in chain manufacture. The machinery will be installed this month.

The Pressed Steel Pole Company, Pittsburgh, Pa., has secured a site at Mount Pleasant, Pa., where it is erecting a new plant, 50 x 200 feet, which will have a capacity of 300 poles a day. The contract for the machinery equipment has been placed with the A. Garrison Foundry Company, and it is expected that the plant will be ready to turn out poles by January.

The Western Launch & Engine Works, Michigan City, Ind., which recently increased its capital stock from $30,000 to $100,000, will probably have to increase the capacity of its plant to take care of its orders.

The Royal Gas Stove Company, Royersford, Pa., has sold its plant and rights to the Buckwalter Stove Company at private terms. E. L. Hallman was president of the company and Ellwood Egolf general manager. The latter owned most of the stock.

The works of the Searchmont Automobile Company, at Chester, Pa., have been sold to Joseph H. Parvin for $85,000. It is said that they will be put into operation.

The National Heating Appliance Company, 115-117 Genesee street, Utica, N. Y., recently incorporated with a capital stock of $15,000, will establish a plant on Charlotte street, that city, where it will manufacture shoals fuel saving attachment for warm air furnaces and stoves. The company has established a Western office in the Roanoke Building, 145 La Salle street, Chicago, where it will carry a complete stock.

J. Eavenson & Sons, Philadelphia, Pa., have purchased most of the machinery that will be required for equipping their new soap making plant at Camden, N. J. Electric power will be used and the boilers will be of the Babcock & Wilcox make.

The Republic Will Dismantle Six Plants.

The Republic Iron & Steel Company in carrying out its policy of centralizing its plants has decided to dismantle six iron mills located in Indiana. The list includes the Central Works, Brazil; Indiana and Muncie, Muncie; Terre Haute and Wabash, Terre Haute, and Alexandria, Alexandria. The Wabash mill has already been dismantled and the machinery is now offered for sale. The Muncie Works has also been dismantled and the razing of the other plants will be proceeded with at an early date. These mills are among the oldest iron mills in the West, and owing to the excessive operating costs, due to a large extent to antiquated machinery, they have been idle for several years. The Alexandria mill was built in 1893, and a large part of the machinery installed was taken from the New Albany rail mill at New Albany and from the Valley Steel Company at Belleville, Ill. It contains nine single and five double puddling furnaces and five trains of rolls. The Central Works was built in 1882 by the Central Iron & Steel Company and contains nine double puddling furnaces as well as six trains of rolls, spike machines, hammers, &c. The Indiana Works was built in 1892 by the Indiana Iron Company, and the machinery was taken from the Lancaster Iron Company, Lancaster, Ohio. It contained 14 single puddling furnaces, six scrap furnaces and four trains of rolls. The Muncie Works was built in 1893 and contained six single puddling furnaces and three trains of rolls. The Terre Haute Works was built in 1868 and contained five double and 16 single puddling furnaces and three trains of rolls. The Wabash Works was built by the Wabash Iron Company in 1874 and contained one double and 15 single puddling furnaces, one scrap furnace and three trains of rolls.

In a paper recently read before the Société des Ingénieurs Civils the magnetic properties are discussed of alloys formed by the union of two metals, one of which was magnetic and the other not. When an alloy of iron and aluminum is formed the alloy is magnetic if the proportion of aluminum is less than 20 per cent. With copper and iron the copper may reach 60 per cent. without destroying the magnetic properties of the resultant material. As a general proposition the combination of two magnetic metals forms a metallic alloy, but one important exception is found in the case of iron and nickel, where the alloy is sometimes magnetic and sometimes not. On the other hand, certain cases have been found where the union of two nonmagnetic metals has produced a magnetic alloy. Manganese and aluminum and tin and antimony form examples of this sort of an exception to the general rule.

It is said that tantalum when used for tool making has wonderful possibilities. Von Bolton has shown by a laboratory experiment that it is both tough and of an extreme hardness, rivaling even the diamond in this respect. A sheet 1 mm. thick (1-25 inch) was hammered from the first piece produced of the pure metal and all attempts to drill a hole through it were found to be futile. Finally a diamond drill was employed, and after continuous work for 70 hours at a speed of 5000 revolutions per minute about one-fourth of the task had been completed, while the drill was so badly worn as to necessitate a discontinuance of the test. (The revolutions figure out at 21,000,000.) Tantalum is entirely nonmagnetic, has a specific gravity varying from 14 to 17 and fuses at about 2300 degrees C. In the form of a wire it has a tensile strength of about 128,000 pounds per square inch.

The Iron and Metal Trades

Contracting for material continues on a very liberal scale, for which a good proof is furnished by the fact that the United States Steel Corporation had on its books on October 31 over 6,300,000 tons of orders.

In Pig Iron, contrary to expectations, a fresh buying movement develops on the heels of the earlier activity. It is understood that the Steel Corporation has taken advantage of the options which it had on November and December Iron and has bought about 20,000 tons of Pig Iron besides. It characterizes the situation that it proved impossible for a large interest to secure from 20,000 to 25,000 tons of metal at Lake Erie furnaces for shipment to Chicago before the close of navigation. There was no spot Iron to be had.

In the Pittsburgh district about 30,000 tons of Bessemer and Basic Pig have been purchased by outside interests, for delivery during the first quarter, a period which the Steel Corporation has not yet considered.

The buying and optioning on the part of the Steel interests have created quite a flurry among the Malleable Iron foundries, who have been rushing into the market East and West. One concern in the Chicago district has bought 9000 tons of Malleable Bessemer and 12,000 tons of Charcoal Iron. Two melters in Milwaukee have bought 20,000 tons of Foundry Iron between them, and a string of good sales, aggregating from 20,000 to 25,000 tons, is reported by New York sellers. So far as the Southern situation is concerned, it is clear that buyers are getting better accustomed to the idea of paying $14 for No. 2 Foundry at Birmingham, at which the principal sellers are holding.

There has been a further movement in Basic Pig in the Eastern markets. A leading interest in New England has contracted for 40,000 tons for delivery over a long period on a sliding scale, another plant has bought 12,000 tons for delivery during the first half of 1906 at $17.50, delivered, and a Steel works connected with a Structural mill has added 11,000 tons in two lots to a purchase last week of a 10,000-ton lot. There has been good buying, too, of Gray Forge.

The Rail trade has been rather quiet during the last week. Outside of a lot of 12,500 tons for a Coal road there have been only additions to former contracts. Some business for Mexico is pending.

In the Structural trade it is of interest to note that next week probably both the new mill at Chicago and the new Clairton mill will be producing. A good part of the tonnage has been sold, however. The most interesting contract of the week is that for 12,000 tons for the new Ohio bridge at Ironton.

In the lighter lines the most noteworthy fact is that the demand for Tin Plate has continued to develop. It is intimated that prices may be soon put up and that this may be done, too, in the case of Sheets.

The Cast Iron Pipe trade continues in a very healthy condition. New York is coming out with a very nice order. It calls for about 30,000 tons in addition to the 7800 tons which are to be let on the 8th.

A pretty large contract for castings has just been awarded to Davies & Thomas for the Steinway Tunnel. The exact quantity has not yet been determined, but it will not be less than 15,000 tons and may go very much above that quantity.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Nov. 1, 1905.	Oct. 25, 1905.	Oct. 4, 1905.	Nov. 2, 1904.
PIG IRON:				
Foundry No. 2 Standard, Philadelphia	**$17.75**	$17.50	$17.00	$15.00
Foundry No. 2 Southern, Cincinnati	**16.25**	15.75	15.00	14.75
Foundry No. 2 Local, Chicago	**17.75**	17.75	16.75	15.00
Bessemer, Pittsburgh	**17.35**	16.85	16.35	13.85
Gray Forge, Pittsburgh	**16.35**	15.85	15.35	13.10
Lake Superior Charcoal, Chicago	**18.50**	18.50	17.50	16.00
BILLETS, RAILS, &c.:				
Bessemer Billets, Pittsburgh	**26.00**	26.00	25.50	19.50
Forging Billets, Pittsburgh	**30.00**	29.00	29.00	22.00
Open Hearth Billets, Philadelphia	28.00	28.00	28.00	22.50
Wire Rods, Pittsburgh	**32.00**	32.00	31.50	26.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL:				
O. Steel Rails, Chicago	14.50	14.50	14.50	12.50
O. Steel Rails, Philadelphia	**17.50**	17.50	16.50	14.00
O. Iron Rails, Chicago	**22.50**	22.50	22.00	19.50
O. Iron Rails, Philadelphia	**24.00**	22.50	22.00	17.00
O. Car Wheels, Chicago	16.00	16.00	16.00	13.50
O. Car Wheels, Philadelphia	**17.00**	17.00	15.50	13.50
Heavy Steel Scrap, Pittsburgh	16.50	16.50	16.50	13.50
Heavy Steel Scrap, Chicago	**15.00**	14.50	14.50	11.50
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	**1.83½**	1.83½	1.73½	1.43½
Common Iron Bars, Chicago	**1.80**	1.80	1.70	1.40
Common Iron Bars, Pittsburgh	**1.80**	1.74¾	1.74¾	1.35
Steel Bars, Tidewater, New York	1.64½	1.64½	1.64½	1.44½
Steel Bars, Pittsburgh	1.50	1.50	1.50	1.30
Tank Plates, Tidewater, New York	1.74½	1.74½	1.74½	1.54½
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.40
Beams, Tidewater, New York	1.84½	1.84½	1.84½	1.54½
Beams, Pittsburgh	1.70	1.70	1.70	1.40
Angles, Tidewater, New York	1.84½	1.84½	1.84½	1.54½
Angles, Pittsburgh	1.70	1.70	1.70	1.40
Skelp, Grooved Steel, Pittsburgh	**1.55**	1.50	1.50	1.35
Skelp, Sheared Steel, Pittsburgh	**1.65**	1.55	1.55	1.40
SHEETS, NAILS AND WIRE:				
Sheets, No. 27, Pittsburgh	*2.15*	2.15	2.20	2.00
Wire Nails, Pittsburgh	1.80	1.80	1.80	1.60
Cut Nails, Pittsburgh	1.65	1.65	1.65	1.60
Barb Wire, Galv., Pittsburgh	2.25	2.25	2.25	2.05
METALS:				
Copper, New York	*16.50*	16.62½	16.62½	13.62½
Spelter, St. Louis	**6.15**	6.10	5.85	5.15
Lead, New York	**5.20**	5.25	4.85	4.40
Lead, St. Louis	**5.15**	5.10	4.82½	4.20
Tin, New York	**33.00**	32.60	32.50	29.00
Antimony, Hallett, New York	12.50	12.50	12.50	7.25
Nickel, New York	40.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	*3.49*	3.49	3.74	3.49

Chicago.

FISHER BUILDING, November 1, 1905.—(*By Telegraph.*)

There has been another outburst of buying of Foundry Iron in the Western market, melters here and in Milwaukee taking close to 50,000 tons, the bulk of which is for delivery the second quarter of next year. One Milwaukee interest purchased 15,000 tons, largely Northern, and a local smelter contracted for 21,000 tons, 12,000 tons of which will be shipped by Lake Superior Charcoal furnaces, and the remainder, 9000 tons of Malleable Bessemer, was placed with Mahoning Valley furnaces. Orders ranging from 2000 to 5000 tons have been numerous, and two inquiries, one for 6000 tons and another for 5000 tons, have just reached sellers. The advancing market is an incentive to consumers to cover as far ahead as furnaces will permit, and all of the buyers that have been in the market during the week bought several months ago for requirements through the first quarter of next year. The production of Western Steel works furnaces is insufficient to meet the demands of the mills, and Pig Iron will probably be shipped from Ohio to relieve the situation. Merchant furnaces continue to be hampered by the shortage of Coke and the inability to lay in stocks will result in temporary bankings when the car shortage becomes more acute. Owing to the shortage of Heavy Melting Steel Scrap at the Carnegie mills shipments will be made to Pittsburgh from local United States Steel Corporation plants, where a large stock is on hand, most of which would otherwise be sold in the open market, as the Open Hearth requirements of these mills is very small. The week's Rail orders total 25,000 tons, and the aggregate for October is exceedingly heavy despite the large bookings in September. The finishing ca-

pacity of the Rail mill of the Illinois Steel Company is being increased with a view of taking care of a production of 700,000 tons next year. The Structural mill of this company at South Chicago will be placed in operation this week, but no tonnage has yet been taken against its output, as a large tonnage of the lighter sections, such as are used in the construction of Steel cars and bolsters, will be transferred from the Carnegie mills. The demand for Structural Material for immediate delivery is not as insistent as it has been and premiums for material from stock are not nearly as large as were paid a month ago. Shippers have been advised of a 20c. advance in freight rates from Virginia furnaces, effective January 1, and this no doubt will be followed by a similar advance on shipments from Southern furnaces.

Pig Iron.—Consumers who covered requirements through the first quarter of next year during the September buying movement are now placing orders for second-quarter delivery. One local foundry purchased 21,000 tons, while two Milwaukee interests took 15,000 and 5000 tons, respectively. Inquiries for 2000 to 6000 ton lots are numerous and a large tonnage will no doubt be placed this week. Northern furnaces as well as those in the South now have their order books pretty well filled through the first half of 1906 and are not anxious for large tonnages, preferring to hold the remainder of their output for current business at the higher prices which will no doubt prevail later. Ohio furnaces are out of the market entirely on Strong Softeners, while producers of High Silicon Irons have withdrawn prices, after announcing an advance of $1 a ton over prevailing prices for deliveries through the first half of next year, and on Malleable Bessemer for time delivery $18.50 is asked by Northern furnaces. Coke shortage already promises to curtail the output of Northern Merchant stacks, and while none of the furnaces has yet been compelled to bank they are entirely dependent on daily deliveries. Virginia furnaces are quoting $15.50 and are offering only a small tonnage on this basis. The Chesapeake & Ohio has already notified shippers of an advance in freight rates of 20c., to take effect on January 1, which will make the rate from Virginia furnaces $2.85, as compared with $2.65, the present rate. This advance will no doubt be followed by a similar advance on the part of Southern roads, which will make the Birmingham rate to Chicago $3.85. We quote, at Chicago, as follows:

Lake Superior Charcoal	$18 50 to $19.00
Northern Coke Foundry, No. 1	18.25 to 18.50
Northern Coke Foundry, No. 2	17.75 to 18.00
Northern Coke Foundry, No. 3	17.25 to 17.50
Northern Scotch, No. 1	18.50 to 19.00
Ohio Strong Softeners, No. 1	18.55 to 18.80
Ohio Strong Softeners, No. 2	18 30 to 18.55
Southern Coke, No. 1	17.65 to 18.15
Southern Coke, No. 2	17.15 to 17.65
Southern Coke, No. 3	16.65 to 17.15
Southern Coke, No. 4	16.15 to 16.65
Southern Coke, No. 1 Soft	17.65 to 18.15
Southern Coke, No. 2 Soft	17.15 to 17.65
Southern Gray Forge and Mottled	15.65 to 15.90
Malleable Bessemer	18.00 to 18.50
Standard Bessemer	18.30
Alabama Basic	18.15

Metals.—Pig Tin, Lead, Spelter and Copper have all advanced during the week, and still higher prices are expected. Lead is notably scarce, while the strength of the Tin market indicates further advances. We quote: Casting Copper, 16½c. to 16⅝c.; Lake, 16⅞c. to 17c.; Pig Tin, car lots, 33¾c. to 34½c.; small lots, 35c. to 35½c.; Spelter, prompt delivery, 6¼c. to 6½c. for car lots; Lead, Desilverized, 5½c. to 5¾c.; Corroding, 6c. for 50-ton lots; on car lots, 2½c. per ton higher; Light Brass, 7¾c.; Sheet Zinc, is $7.50, list, f.o.b. Lasalle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 14¾c.; Heavy Copper, 14¼c.; Copper Bottoms, 13½c.; Copper Clips, 14¼c.; Red Brass, 13¾c.; Red Brass Borings, 11¼c.; Yellow Brass, Heavy, 10c.; Yellow Brass Borings, 8¼c.; Light Brass, 8c.; Lead Pipe, 4½c.; Tea Lead, 4.10c.; Zinc, 4½c.; Pewter, No. 1, 21c.; Block Tin Pipe, 27½c.

(By Mail.)

Billets.—Only one mill is now in position to make prompt deliveries of Forging Billets and prices have been advanced during the week to $35, with the usual extras in car lots and over. The Illinois Steel Company has now been out of the market for more than two weeks, and owing to the heavy demand for Steel from its finishing mills it is hardly probable that it will again be in position to sell in the open market until its seven Open Hearth furnaces have been completed.

Rails and Track Supplies.—Two additional contracts calling for the delivery of 25,000 tons of Standard Section Rails in 1906 have been placed with the local mill during the week. The tonnage taken last month, while not nearly as heavy as that during December, is close to 200,000 tons. In order to secure a greater tonnage next year the finishing capacity of this mill is now being increased, and with these added facilities it is believed that the output next year will reach 700,000 tons. The Light Rail tonnage closed during October was double the output and inquiries now on hand indicate a heavy buying movement during November. Track Material continues in heavy demand and higher prices are expected on Spikes and Bolts. Quotations are unchanged, as follows: Angle Bars, accompanying Rail orders, 1906 delivery, 1.50c.; carload lots, 1.75c.; Spikes, 1.85c. to 1.95c.; Track Bolts, 2.40c. to 2.50c., base, Square Nuts. The store prices on Track Supplies range from 15c. to 20c. above mill prices. Light Rails, 30-lb. to 45-lb. Sections, $25.50; 25-lb., $26.50; 20-lb., $27.50; 16-lb., $29; 12-lb., $30; lighter Sections down to 8-lb., $35 to $38, f.o.b. mill. Standard Sections are quoted $28, f.o.b. mill, full freight to destination.

Structural Material.—The new Structural mill of the Illinois Steel Company will be placed in operation this week. Contracts against its output have not yet been closed and the present policy precludes the taking on of any new business for this mill until early next year. As the Carnegie mills are hard pressed for deliveries a big tonnage of the lighter Sections, such as are used in the construction of Steel cars, will be transferred from Pittsburgh. Demand for lighter Sections for immediate shipment, which has been exceedingly heavy during the past few months, has eased up considerably and consumers are not nearly as ready to pay the high premiums that have been prevailing. In consequence the bulk of the material from stock is now selling at an average of 2c. to 2¼c. For future delivery from mill we make the following quotations: Beams and Channels, 3 to 15 inches, inclusive, 1.86½c.; Angles, 3 to 6 inches, ¼-inch and heavier, 1.86½c.; Angles larger than 6 inches on one or both legs, 1.96½c.; Beams, larger than 15 inches, 1.96½c.; Zees, 3 inches and over, 1.86½c.; Tees, 3 inches and over, 1.91½c., in addition to the usual extras for cutting to extra lengths, punching, coping, bending or other shop work. Store prices on Angles, Beams and Channels range from 2.50c. to 3c., according to quantity on hand, in store or obtainable from mill.

Plates.—Mills are completely swamped with specifications, especially those sizes that are used in the construction of Steel cars and bolsters. Current business is light and is limited almost entirely to sales from jobbers' stocks. On account of the avalanche of specifications that continue to be received by the mills from day to day deliveries continue to be further deferred, and despite the increased Plate production now available on account of the new mills that have come in this year no relief is in sight. Prices are firm and unchanged, as follows: Tank quality, ¼-inch and heavier, wider than 6¼ and up to 100 inches wide, inclusive, car lots, Chicago, 1.76½c.; 3-16 inch, 1.86½c.; Nos. 7 and 8 gauge, 1.91½c.; No. 9, 2.01½c.; Flange quality in widths up to 100 inches, 1.86½c., base, for ¼-inch and heavier, with the same advances for lighter weights; Sketch Plates, Tank quality, 1.86½c.; Flange quality, 1.96½c. Store prices on Plates are as follows: Tank Plate, ¼-inch and heavier, up to 72 inches wide, 2c. to 2.10c.; from 72 to 96 inches wide, 2.10c. to 2.20c.; 3-16 inch up to 60 inches wide, 2.10c. to 2.20c.; 72 inches wide, 2.35c. to 2.45c.; No. 8 up to 60 inches wide, 2.10c. to 2.15c.; Flange quality, 25c. extra.

Sheets.—Lower prices are again prevailing on the lighter gauges of both Black and Galvanized Sheets, due to a large extent to the off season and the discontinuance of building operations. Western packing interests have not bought as heavily as anticipated, and while mills are well fixed on the heavier gauges the tonnage of Light Sheets is comparatively small. Galvanized Sheets, 28 gauge, are offered in this market at 3.20c. to 3.25c. and on Black Sheets 2.20c. can readily be done. We revise quotations, as follows: Blue Annealed, Nos. 9 and 10, 1.81½c. to 1.86½c.; Box Annealed, Nos. 18 and 20, 2.16½c. to 2.21½c.; No. 27, 2.26½c. to 2.31½c.; No. 28, 2.36½c. to 2.41½c., with the customary differentials between gauges. Store prices are 2c. to 2.10c. for No. 10 Blue, 2.05c. to 2.15c. for No. 12 Box, 2.10c. to 2.20c. for No. 14, 2.20c. to 2.30c. for No. 16, 2.40c. to 2.50c. for Nos 18 and 20, 2.50c. for Nos. 22 and 24, 2.55c. to 2.65c. for No. 26, 2.60c. to 2.70c. for No. 27, 2.70c. to 2.80c. for No. 28, 2.95c. to 3.05c. for No. 30. Galvanized Sheets are quoted in car lots from mill at the following prices: No. 10, 2.36½c. to 2.41½c.; Nos. 17 to 21, 2.71½c. to 2.76½c.; No. 27, 3.21½c. to 3.26½c.; No. 28, 3.36½c. to 3.41½c. Store prices on Galvanized Sheets are firmer than for some time and high prices are being demanded for sizes difficult to obtain. Prices are as follows: Nos. 10, 12 and 14, 3.10c. to 3.20c.; Nos. 16 to 20, 2.90c. to 3c.; Nos. 22 to 24, 3c. to 3.15c.; No. 26, 3.20c. to 3.35c.; No. 27, 3.40c. to 3.55c.; No. 28, 3.60c. to 3.75c.; No. 34, 4.85c. to 4.95c

Bars.—Notwithstanding the fact that Steel Bars are selling on an average of $3 a ton below Iron the Iron mills throughout the West have their capacity taken during the next three or four months, and while the leading producers are asking 1.80c., delivered, Chicago, a few of the mills are quoting an advance of $1 to $2 a ton. Steel Bar specifications continue greatly in excess of shipments, and new business continues heavy considering the large contracts which have been recently placed. We make the following quota-

tions: Iron Bars, 1.80c.; Steel Bars, 1.66½c., both half extras; Hoops, 1.91½c., extras as per Hoop card; Bands, 1.66½c., as per Steel card; Soft Steel Angles and Shapes, 1.76½c., half extras, and Hard Steel Angles and Bars at about 10c. below the price of Soft Steel. In store prices Steel Bars and Bands are being held at a minimum of 1.85c., base, half extras; Steel Angles and Shapes, 1.95c., half extras, and Soft Steel Hoops, 2.20c., full extras, with 5c. to 10c. higher than the minimum prices named for small quantities from store.

Merchant Steel.—Implement and vehicle manufacturers continue to press the mills for deliveries. The output of all kinds of agricultural implements and vehicles promises to be the greatest in the history of the Western trade and manufacturers find that orders placed earlier in the year with the Steel mills are not sufficient to meet requirements. Demand for high grade Tool Steel is also heavy and the mills are unable to make early deliveries. We make the following quotations: Planished or Smooth Finished Tire Steel, 1.70c.; Iron finish up to 1½ x ½ inch, 1.65c., and Iron finish, 1½ x ½ inch and larger, 1.50c., base, Pittsburgh, and Channels for solid rubber tire are quoted as follows: ¾, ⅞ and 1 inch, 2c., and 1⅛-inch and larger, 1.90c., Pittsburgh; Smooth Finished Machinery Steel, 1.91½c.; Flat Sleigh Shoe, 1.71½c.; Concave and Convex Sleigh Shoe, 1.86½c.; Cutter Shoe, 2.40c.; Toe Calk Steel, 2.21½c.; Railway Spring, 1.86½c.; Crucible Tool Steel, 6½c. to 8c.; special grades of Tool Steel, 13c. and up; Shafting, 50 per cent. discount on car lots and 45 per cent. in less than car lots, in base territory.

Merchant Pipe.—Specifications received by the mills during the past week were heavier than at any time in the past two months, indicating a heavy movement from jobbers' stocks. Little new business, however, is being placed. Current discounts to consumers from mill continue to be maintained and are as follows: Black Steel Pipe, 78.35 per cent. on the base sizes, ¾ to 6 inches, and Galvanized, 68.35 per cent. Iron Pipe is quoted from 1½ to 2 points higher. From store in small lots Chicago jobbers are quoting 76½ to 77 per cent. on Black Steel Pipe, ¾ to 6 inches.

Boiler Tubes.—Current demand continues heavy and is largely limited to the job boiler shops, the heavy consumers having placed contracts some time ago. Mills continue to maintain prices, which they can readily do in view of the heavy tonnage on their books, but here and there jobbers are shading to secure desirable business. Official discounts, f.o.b. Chicago, in car lots, are as follows: Steel Tubes, 62.35; Iron, 51.35; Seamless, 50.35. Store prices are unchanged, as follows:

	Steel.	Iron.	Seamless.
1 to 1½ inches	40	35	42½
1¾ to 2¼ inches	50	35	35
2½ inches	52½	35	30
2¾ to 5 inches	60	47½	42½
6 inches and larger	50	35	..

Cast Iron Pipe.—The contract for 5000 tons, in sizes ranging from 4 to 30 inches, for the city of Los Angeles was finally awarded the United States Cast Iron Pipe Company this week. All of the municipal lettings in this Western territory have not been disposed of and little new business in this line will be placed until next year. Current business is good, but will no doubt drop off materially with the advent of cold weather. On current business prices are unchanged, as follows, f.o.b. Chicago, per net ton: Water Pipe, 4-inch, $30; 6, 8, 10 and 12 inch, $29; over 12-inch, $28, with $1 extra for Gas Pipe. Very large municipal contracts are placed on a somewhat lower basis.

Coke.—As a result of the scarcity of Connellsville Foundry Coke in the Western market shippers are in position to secure almost any price they ask from consumers that had not covered requirements or have been caught short. Sales of car lots of Connellsville Foundry Coke have been made during the week on the basis of $3.60 to $3.75 at the ovens. Wise County Coke is now quoted at $4 at the ovens, equivalent to $6.25, Chicago. The lack of transportation facilities is greatly interfering with deliveries of Furnace Coke and the indications are that some of the Western stacks will be compelled to shut down for brief periods during the winter months when the shortage of cars becomes more acute.

Old Materials.—While the railroads continue to secure good prices for their material, stocks in the hands of dealers are being offered at lower values. The material disposed of by the Chicago, Burlington & Quincy road last week was readily disposed of at ruling market prices, and in a few cases prices slightly higher than those secured last week were obtained. On account of the impending shortage of Heavy Melting Stock in the Pittsburgh district the leading producer of this material in the West has been notified to make no more sales in the open market, and it is probable that heavy shipments from this stock of 50,000 tons will be made at an early date to Pittsburgh. The shipment of Steel Scrap from Chicago to Pittsburgh is an unusual procedure and is only a further indication of the tremendous pressure on the Steel mills at the present time. The range of prices paid by large consumers to producers and dealers, in carloads, f.o.b. Chicago, is as follows:

Old Iron Rails	$22.50 to $23.50
Old Steel Rails, 4 feet and over	16.00 to 16.50
Old Steel Rails, less than 4 feet	14.50 to 15.00
Heavy Relaying Rails, subject to inspection	26.50 to 27.00
Old Car Wheels	16.00 to 16.50
Heavy Melting Steel Scrap	15.00 to 15.25
Frogs, Switches and Guards	15.00 to 15.25
Mixed Steel	13.00 to 13.50

The following quotations are per net ton:

Iron Fish Plates	$18.50 to $19.00
Iron Car Axles	23.00 to 23.50
Steel Car Axles	18.00 to 18.50
No. 1 Railroad Wrought	17.00 to 17.50
No. 2 Railroad Wrought	16.00 to 16.50
Locomotive Tires, smooth	14.25 to 14.50
Railway Springs	14.00 to 14.50
No. 1 Dealers' Forge	14.00 to 14.50
Wrought Pipes and Flues	12.50 to 13.00
No. 1 Cut Busheling	11.75 to 12.00
Iron Axle Turnings	11.50 to 11.75
Soft Steel Axle Turnings	11.50 to 11.75
Machine Shop Turnings	11.00 to 11.50
Cast Borings	9.50 to 9.75
Mixed Borings, &c	9.50 to 9.75
No. 1 Mill	10.00 to 10.50
Country Sheet	9.00 to 9.25
No. 1 Boilers, cut to Sheets and Rings	11.75 to 12.25
No. 1 Cast Scrap	13.50 to 14.00
Stove Plate and Light Cast Scrap	11.00 to 11.50
Railroad Malleable	14.25 to 14.50
Agricultural Malleable	13.25 to 13.75

Philadelphia.

REAL ESTATE TRUST BUILDING, October 30, 1905.

The Iron and Steel markets have again become active, with a tendency toward higher prices, especially for raw materials. It is difficult to follow the various movements in Pig Iron, as there is no concerted action, every seller making his own price, varying as much as $1 per ton between the highest and the lowest. At the moment, however, the feeling is very aggressive and it looks like higher prices in the near future. As already stated, there is no uniformity of action, some having taken business during the week at $17.50 to $17.75 for No. 2 X, while others who quoted $18 to $18.25 for good sized lots have been much surprised to find that most of the offers were promptly accepted. This indicates the attitude of buyers, which is by no means what producers like. They have sold a large proportion of their output for delivery during the next six months at low prices and they have no desire to sell more even at the full prices above named. They consider that they have done their full duty to their customers, and confronted as they are with higher costs they want some leeway to work on in case of still higher prices, which from present appearances are almost inevitable. This to a great extent has been brought about by the insatiate demands of buyers, who, like Oliver Twist, make continual demands for more. One reason why makers of Pig Iron are unwilling to enter additional orders is that the situation may be very different six of eight months hence from what it is now, and if prices should be several dollars per ton higher at that time it would leave producers in a very bad position, while in case of a decline there might be some difficulty in getting shipping instructions on high priced lots. The latter will apparently be a very improbable alternative, but it is not entirely beyond the range of possibilities and must therefore be reckoned with accordingly. Intrinsically business conditions are excellent, but a great deal of the buying is speculative and in expectation that the material will be wanted rather than to cover actual commitments, although these are no doubt very heavy. Buyers are therefore advancing prices on themselves; whether they are wise in doing it or not (regarded from a speculative point of view) is something that time alone can determine. Apart from the renewal of interest in Pig Iron the situation is much the same as it was a week ago. Prices are steady, but they are not higher, although the demand for finished materials is of a satisfactory character and prices are liable at any moment to follow the lead of Pig Iron. The feeling is one of confidence, however, and is undoubtedly based on a broad and most substantial foundation.

Pig Iron.—The market has taken on renewed strength and prices are 25c. to 50c. per ton higher than they were a week ago. The demand is so urgent that producers have been almost forced into making quotations, although they claim that they would much prefer that buyers would hold off for a while. In order to dampen their ardor prices have been advanced to figures which it was hoped would be considered as too high, but in most cases the offers were promptly accepted, so that a new range of prices have been established. There is practically nothing available at last week's figures and as a rule 25c. is the minimum and 50c. the maximum advance. The feeling is still very strong, however, and it is by no means certain that further advances will not be made in the near future. Ordinarily it might be supposed that after such continuous heavy buying during the past two or three months there would be something of a let up in the demand, but it is simply a case of history repeating itself. On a rising market there is no end to buy-

ers' demands, and on a decline there appears to be no end to the time they can remain out of the market. Prices are not high compared to the figures they reached on the great movement in 1901, and they are quite likely to go higher on this movement, but much will depend upon what action buyers take. There is no need for higher prices, but buyers will probably force them up in spite of the admonition of sellers, who for the present are strong advocates of conservative methods. It is pretty clear that they intend making their contracts much stronger than they formerly did, and those who buy Iron will be expected to take it on dates which will be distinctly specified. To-day's prices vary from $17.75 to $18.25 for No. 2 X Foundry and $16.25 to $16.50 for standard brands of Gray Forge. Basic has been sold rather heavily at $17.50, but to-day's prices are $17.75 firm, with a good deal of inquiry for delivery during first half of 1906. Western buyers are paying relatively more money for Virginia Basic, which is reported to have been sold quite heavily the past few days at about $16.50, f.o.b. furnace. The range for to-day's prices, Philadelphia and nearby deliveries, would be about as follows:

No. 2 X Foundry	$17.75 to $18.25
No. 2 Plain	17.25 to 17.50
No. 2 Southern	17.75 to 18.00
Standard Gray Forge	16.25 to 16.50
Basic	17.50 to 17.75
Low Phosphorus	22.50 to 23.50

Ferromanganese.—The scarcity is more marked than it has yet been, and those who have it to spare can get $63 to $64 for carload lots, spot delivery. Large lots for next year's shipment would probably not command more than $55, but there is no urgency to either buy or sell except for this year's shipments.

Ferrosilicon.—Not very active, but prices are maintained as last quoted: 11 per cent., $29 to $30; 50 per cent., $95, and 75 per cent., $170 to $175.

Steel.—Mills are about full for this year's shipments, which are quoted at $28 to $30, according to character of order. Forging Billets command $32 to $35, delivered at nearby points.

Muck Bars.—Very quiet, although one fair sized lot was taken at $28, seller's mill, for all Ore Bars.

Plates.—There is no material change in the Plate trade. Orders are coming in in good volume from all the leading consuming interests, and prices are firm. In some cases prompt shipments command a slight advance, but officially prices are the same as last week, viz.:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.73½	1.78½
Flange or Boiler Steel	1.83½	1.88½
Marine, A. B. M. A. and Commercial Fire Box Steel	1.93½	1.98½
Still Bottom Steel	2.03½	2.08½
Locomotive Fire Box Steel	2.23½	2.28½

The above are base prices for ¼-inch and heavier. The following extras apply:

	Per 100 pounds extra.
5-16-inch thick	$0.10
Nos. 7 and 8, B. W. G.	.15 "
No. 9, B. W. G.	.25 "
Plates over 100 to 110 inches	.05 "
Plates over 110 to 115 inches	.10 "
Plates over 115 to 120 inches	.15 "
Plates over 120 to 125 inches	.25 "
Plates over 125 to 130 inches	.50 "
Plates over 130 inches	1.00 "

Structural Material.—There is nothing to add to what has been said week by week for months past. Mills are full up with work and deliveries are weeks behind, while they have months of work before them. For special deliveries extra prices have to be paid, but officially quotations are unchanged, as follows: Beams and Channels up to 15 inches at 1.83½c. to 2c., and a tenth more for large sizes, and about the same schedule for Angles.

Bars.—The demand is very good and prices are gradually working higher, and although officially quotations are 1.73½c. for Refined Iron, it is impossible to place any order at that figure. Some of the mills quote 1.83½c., but others want from $1 to $2 more, and are said to be getting some business on the terms named. Steel Bars are quoted at a tenth or two below Refined Iron, but it is difficult to get deliveries of a full range of sizes unless by paying well up to the price of Refined Bar Iron.

Sheets.—A good demand is reported, but prices fail to advance in proportion with the rest of the market, but it is believed the turning point is not far in the distance. Prices as last quoted, viz.: 18 to 20 gauge, 2.30c.; 22 to 24 gauge, 2.40c.; 25 and 26 gauge, 2.50c.; 27 gauge, 2.60c., and 28 gauge, 2.70c.

Old Material.—There is a strong market for nearly everything on the list, although Steel seems to be the leader. Consumers are getting a fair tonnage at $17.50 to $17.75, but for large sized lots holders ask $18 to $18.50. Bids and offers for deliveries in buyers' yards are about as follows:

Scrap Steel Rails	$17.50 to $18.50
No. 1 Steel Scrap	17.50 to 18.00
Low Phosphorus Scrap	22.00 to 22.50
Old Steel Axles	21.50 to 22.50
Old Iron Axles	27.50 to 28.00
Old Iron Rails	24.00 to 25.00
Old Car Wheels	17.00 to 17.50
Choice Scrap, R. R. No. 1 Wrought	22.50 to 23.00
No. 1 Yard Scrap	19.50 to 20.50
Long and Short	18.50 to 19.50
Machinery Scrap	16.00 to 16.50
Wrought Iron Pipe	17.00 to 17.50
No. 1 Forge Fire Scrap	15.50 to 16.00
No. 2 Light Ordinary	12.50 to 13.00
Wrought Turnings	14.50 to 15.00
Axle Turnings, Choice Heavy	15.00 to 15.50
Cast Borings	10.00 to 10.50
Stove Plates	13.00 to 13.50
Grate Bars	12.75 to 13.00

Pittsburgh.

PARK BUILDING, November 1, 1905.—(*By Telegraph.*)

Pig Iron.—In addition to the purchase this week of 45,000 tons of Bessemer Iron by the United States Steel Corporation there have been other heavy transactions in Bessemer and Basic Iron, mostly for delivery in the first quarter of next year, which run the total up to 80,000 tons or more. Heavy inquiries are in the market from several of the leading Steel companies for Bessemer and Basic Iron for first quarter delivery. Prices are firm, with every probability of going higher. The absolute minimum of the market to-day on Bessemer and Basic Iron is $16.50, Valley furnace, or $17.35, Pittsburgh, and a number of sellers are quoting $17, at furnace. It is probable that the Steel Corporation will take the surplus Iron of the two leading sellers for January, February and March delivery. There is a good deal of activity in Foundry Iron, some furnace companies being so well sold up that they are practically out of the market, taking care only of their regular trade. Northern brands of No. 2 Foundry are now firm on the basis of $16.50, Valley furnace, while some sellers are asking higher prices. We also note a good deal of activity in Forge Iron, two or three local consumers being in the market for upward of 6000 tons, part of which will likely be closed to-day (Wednesday). Prices of Forge are higher and Northern brands are firmly held at $15.50, Valley furnace, or $16.35, Pittsburgh. A sale of 1500 tons to a local consumer has been made at this price.

Steel.—There is a moderate inquiry for Billets and Bars, but most consumers are covered by regular contracts. The mills are making only fairly satisfactory deliveries on contracts and occasionally some of them have to close down for a short period waiting for Steel. Bessemer Billets are held at $26, Pittsburgh, while Open Hearth are $27 to $28 and are very hard to obtain even at these prices. To consumers having regular contracts prices of Sheet and Tin Bars in random lengths for November delivery will be $27, Pittsburgh. Forging Billets are scarce and higher and we quote these at $30 and upward.

Iron Bars.—The higher prices for Muck Bar and the heavy orders being placed with the mills have brought about another advance in prices of Iron Bars, which are now held at 1.80c. to 1.85c., Pittsburgh. The Republic Iron & Steel Company quotes Iron Bars at 1.80c., Youngstown, or practically 1.85c., Pittsburgh.

(*By Mail.*)

The past week has been extraordinarily active in Pig Iron, and in spite of the announced policy of the large producers and consumers to use their utmost efforts to hold prices in check and prevent a runaway market there has been a clean advance of $1 a ton in prices of Bessemer and Basic Iron since our last report, with every indication of still higher values. The United States Steel Corporation closed to-day (Tuesday) for the purchase of 45,000 tons of Bessemer Iron for November and December delivery, of which the Bessemer Pig Iron Association took 25,000 tons and W. P. Synder & Co. 20,000 tons, the price being $16.50 at Valley furnace. Indications are that the Steel Corporation will take practically all of the Bessemer Iron that these two interests can furnish for January, February and March delivery and it is understood negotiations are on to that effect. Other large interests have bought heavily of Bessemer and Basic Iron, one Valley interest buying 15,000 tons, two local consumers 10,500 tons and another interest 4000 tons. All this latter Iron was for first-quarter delivery and the price was $16.50 at Valley furnace, which is absolute minimum of the market to-day. In fact it is very doubtful whether any tonnage of Bessemer or Basic Iron could be picked up at this writing at less than $17, Valley furnace, a number of brokers now quoting that price. The available supply of Bessemer and Basic Iron for November and December delivery has been practically cleaned up by this last purchase of the Steel Corporation, but a fair tonnage is held by brokers, who are taking advantage of the situation and are trying to get $17 for what Iron they can spare. The market on Foundry Iron is more active and prices are very firm, most leading sellers now quoting $16.50 at Valley furnace, while some sellers quote $17 at furnace. There is more inquiry for Forge Iron and Northern brands are held at $15 at furnace, with some sellers quoting $15.25 to $15.50. The greatest activity prevails throughout the whole Pig Iron market and higher prices are absolutely certain.

The supply of Steel for the outside market seems to get

less right along, and any consumers that are not covered by regular contracts are having great trouble in getting Billets, Sheet or Tin Bars. In fact some mills that have contracts cannot get deliveries fast enough and are occasionally compelled to shut down for lack of Steel. Bessemer Billets are all of $26, Pittsburgh, while Open Hearth Billets are difficult to quote, as there are practically none being offered. They would probably bring $27 to $28 for prompt delivery. Sheet and Tin Bars in random lengths for November delivery are $27, maker's mill. It is said that large concerns that have contracts for Billets based on monthly prices of Pig Iron will pay about $25 for their November Steel. In Finished Material conditions are exceedingly active, and the tonnage of Structural Steel and Plates that the mills have on their books and that is in sight is simply unprecedented and will take the output of the mills for the next six months or more. The New York Central Railroad is in the market for 25,000 Steel cars, but none of the Steel car companies can commence deliveries on the order before March or April next year. Steel Bars and the larger sizes of Pipe are very active, and the same is true of Sheets. Tin Plate is also in much better demand, the leading interest having taken a large tonnage for the Pacific Coast and also for export.

Ferromanganese.—We note a continued active inquiry for Ferro for prompt delivery, and with very little in sight. We quote 80 per cent. foreign Ferro at $63 to $65, Pittsburgh. The local interest has not been a seller of Ferro for some months, but on the contrary is said to have been a buyer at different times.

Steel Rails.—The Baltimore & Ohio order for 75,000 tons and the balance of the New York Central order, 35,000 tons, will likely be placed this week. Other large contracts are in sight. The capacity of the Rail mills for the first six months of 1906 or longer is already sold. All records for Rail production were broken this month by the Edgar Thomson mill of the Carnegie Steel Company, which with the finish of the night turn of October 29 had made about 81,000 tons. With the two remaining days yet to be heard from the Edgar Thomson mill in 26 working days will have turned out over 85,000 tons of Steel Rails, an unprecedented record and one that will likely stand for some time. No. 3 Rail mill at this plant is now in operation, rolling the lighter Sections. We quote Standard Sections at $28 and Splice Bars 1.50c. at mill. Light Rails are in good demand and prices are firm, as follows: 8-lb., $36 to $37; 10-lb., $32 to $33; 12-lb., $29 to $30; 16-lb., $27 to $28; 25-lb. to 45-lb., $26 to $26.50, all f.o.b. cars maker's mill.

Rods.—We note an active inquiry for both Bessemer and Open Hearth Rods, with the available supply very limited. The two leading sellers are out of the market, needing their entire output of Rods for their finishing mills. We quote Bessemer and Open Hearth Rods at $32 and Open Hearth Chain Rods at $33, maker's mill.

Muck Bar.—A sale of 2500 tons of Muck Bar is reported at $28, Pittsburgh, but leading sellers now quote $28.25 to $28.50 for best grades of Muck Bar made from all Pig Iron.

Skelp.—The Skelp mills are crowded with tonnage, and owing to higher prices of Raw Material Skelp has shown a sharp advance. We have revised our prices and now quote: Grooved Steel Skelp, 1.55c. to 1.60c.; Sheared, 1.65c. to 1.70c.; Grooved Iron Skelp, 1.65c. to 1.70c., and Sheared, 1.75c. to 1.80c. These prices are for ordinary widths and are f.o.b. maker's mill.

Plates.—If the New York Central order for 25,000 Steel cars is placed, and it very likely will be given out within the next week, it means upward of 300,000 tons of Plates and Small Shapes for the mills in addition to the enormous tonnage which they already have on their books. Orders from the general trade are coming in quite freely, and the smaller Plate mills that can make prompt shipment are sometimes able to get slight premiums. Prices are very firm, but without change, and we quote: Tank Plates, ¼ inch thick, 6¼ up to 100 inches in width, 1.60c., base, at mills, Pittsburgh. Extras over the above prices are as follows:

	Extra per 100 pounds.
Gauges lighter than ¼-inch to and including 3-16-inch Plates on thin edge	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 inches	.05
Plates over 110 to 115 inches	.10
Plates over 115 to 120 inches	.15
Plates over 120 to 125 inches	.25
Plates over 125 to 130 inches	.50
Plates over 130 inches	1.00
All sketches (excepting straight taper Plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
Marine, "A. B. M. A.," and ordinary Fire Box Steel Plates	.20
Still Bottom Steel	.30
Locomotive Fire Box Steel	.50
Shell Grade of Steel is abandoned.	

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within ten days from date thereof, discount of ½ of 1 per cent. is allowable. Pacific Coast base, 1.40c. f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 inches wide down to 6 inches of Tank, Ship or Bridge quality.

Structural Material.—Some heavy contracts have been placed and a good deal of work is in sight, in spite of the late season. The American Bridge Company has secured the material for a bridge over the Ohio River at Ironton, Ohio, about 12,000 tons; also a large tonnage in Girders for the Wabash, an office building in Rochester, N. Y., about 1700 tons, and the Structural Steel for a saw mill in Sheridan, La. This is an innovation in the building of saw mills and so far as known is the first saw mill to be erected of Steel frame construction. The 20-story office building to be erected by the Union National Bank on the corner of Fourth avenue and Wood street in this city is a go and bids for the Steel, 7000 to 8000 tons, will soon be asked. Deliveries of material from the mills are still very unsatisfactory and on the medium sizes of Beams and Channels made from Open Hearth Stock are three to four months behind. The leading Structural interests are practically filled for the next six months and premiums are being paid on small lots of material for prompt shipment. We quote: Beams and Channels, up to 15-inch, 1.70c.; over 15-inch, 1.80c.; Angles, 3 x 2 x ¼ inch thick up to 6 x 6 inches, 1.70c.; Angles, 8 x 8 and 7 x 3½ inches, 1.80c.; Zees, 3-inch and larger, 1.70c.; Tees, 3-inch and larger, 1.75c. Under the Steel Bar card Angles, Channels and Tees under 3-inch are 1.60c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—Conditions in the Sheet trade seem to be shaping themselves for an early advance in prices by the leading interest, which may be announced at any time, although nothing official has been given out. The demand for Sheets is now quite active, and with Sheet Bars ruling at about $27 there is no reason why prices of Sheets should not be higher. Some of the mills refuse to sell very far ahead at present prices, believing it is a matter of a very short time until the market is higher. Prices are firm and we quote: Black Sheets, box annealed, one pass through cold rolls, Nos. 22 and 24 gauge, 2.05c.; Nos. 25 and 26, 2.10c.; No. 27, 2.15c.; No. 28, 2.25c.; No. 29, 2.40c., and No. 30 gauge, 2.50c. Galvanized Sheets are firm in price and we quote: Nos. 22 and 24, 2.70c.; Nos. 25 and 26, 2.90c.; No. 27, 3.10c.; No. 28, 3.30c.; No. 29, 3.55c.; No. 30, 3.80c. We quote No. 28 gauge Painted Roofing Sheets at $1.60 per square, and Galvanized Roofing Shets, No. 28 gauge, at $2.80 for 2½-inch corrugation. Jobbers charge the usual advances over these prices for small lots from store.

Iron and Steel Bars.—A very heavy tonnage of Steel Bars was placed in October and the leading mills are fully sold up for the next three or four months. Consumers are placing orders liberally, feeling assured that the market will not be any lower, but may possibly be higher. The demand for Iron Bars is very active and the mills have a very large tonnage on their books. We quote Iron Bars at 1.70c., Youngstown, or 1.74¼c., Pittsburgh, and Steel Bars at 1.50c., base, half extras, for carloads and larger lots.

Hoops and Bands.—A fair amount of current tonnage is being placed and specifications on contracts are coming in very freely. We quote Steel Hoops at 1.75c. and Bands to be used for cooperage purposes at 1.75c., the latter carrying full Hoop and Band extras. Bands for other than cooperage purposes are 1.50c., base, half extras, as per Standard Steel card. Above prices are for carload lots, f.o.b. Pittsburgh, plus full tariff rail rate to point of delivery.

Tin Plate.—Consumers are realizing more and more that the present price of $3.30 per box on Tin Plate is very low and are sending in orders more freely than for some time, so that tonnage in Tin Plate is steadily expanding. As noted last week, several leading mills that have a good deal of tonnage booked are now quoting an advance of 5c. to 10c. a box over the official price. We quote Tin Plate at $3.30 per base box, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days.

Merchant Steel.—Current tonnage is fairly heavy, while specifications on contracts are coming in very freely. The two leading interests, these being the Cambria and Crucible Steel companies, are practically sold up for the next three months and are not actively soliciting business for delivery prior to February. On some grades of Soft Steel premiums for early delivery are being asked. For current tonnage we quote: Smooth Finished Tire, 1.70c.; Toe Calk Steel, 2c. to 2.05c.; Railway Spring Steel, 1.65c. to 1.70c.; Cutter Shoes, 2.20c. to 2.25c.; Flat Sleigh Shoe, 1.50c. to 1.55c.; Crucible Tool Steel, 6c. to 8c. for ordinary grades and 12c. and upward for special grades. The demand for Shafting is quite heavy, which we quote at 50 per cent. discount in carloads and 45 per cent. in less than carloads, delivered in base territory.

Railroad Spikes.—We note a continued heavy demand and prices are very firm. We quote Railroad Spikes at $1.85 per 100 lbs., maker's mill.

Spelter.—The demand is very active, and this with export shipments has caused a further advance in prices. We quote prime grades of Western Spelter at 6.05c. to 6.10c., St. Louis, equal to 6.17½c. and 6.22½c., Pittsburgh. These are the highest prices that Spelter has touched in some years.

Merchant Pipe.—The tonnage in Pipe in October, especially in the larger sizes, was very heavy and the tone of the market is firmer, although prices have not shown any actual advance. On the larger sizes, from 4 inches and up, the leading mills are filled for some months ahead. Owing to the general advancing tendency of the whole market it is believed it will be a matter of only a short time until prices on Pipe are advanced. The recent advances in prices of Oil are causing some demand for Oil country goods. Discounts are as follows:

Merchant Pipe.

	Jobbers, carloads.				Consumers, carloads.			
	Steel.		Iron.		Steel.		Iron.	
	Blk.	Galv.	Blk.	Galv.	Blk.	Galv.	Blk.	Galv.
	%	%	%	%	%	%	%	%
⅛ and ¼ inch	72	56	69½	53½	71	55	68½	52½
⅜ and ½ inch	76	64	73½	61½	75	63	72½	60½
¾ to 6 inches	80	70	78	68	79	69	77	67
7 to 12 inches	75	60	73	57½	74	59	72	56½
Extra strong, plain ends:								
⅛ to ⅜ inch	65	53	62½	50½	64	52	61½	49½
½ to 4 inches	72	60	69½	57½	71	59	68½	56½
4½ to 8 inches	68	56	65½	53½	67	55	64½	52½
Double extra strong, plain ends:								
½ to 8 inches	61	50	58½	47½	60	49	57½	46½

Boiler Tubes.—Current demand continues heavy, and reports of any shading in prices have been officially denied. There is no reason whatever why Boiler Tubes should be shaded, as the mills are full of tonnage and are two to three months behind on deliveries. Prices are firm, discounts being as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1½ inches	41	44
1¾ to 2¼ inches	41	56
2½ inches	46	58
2¾ to 5 inches	53	64
6 to 13 inches	41	56

Coke.—The report that the W. J. Rainey Coke Company had sold its entire output of Coke for first half of next year to the United States Steel Corporation turns out to be untrue. The Rainey Company has persistently refused to take contracts for next year until very recently, when it came in the market as a seller, and is reported to have secured several large contracts for Furnace Coke on the basis of $2.90 to $3 a ton at oven for first half of next year's delivery. There is an enormous demand for Furnace Coke, and additional sales other than the Rainey orders of strictly Connellsville Furnace Coke have been made at $3 a ton, at oven. Contracts for strictly Connellsville 72-hour Foundry Coke have been made on the basis of $3.50 a ton, at oven. Output of Coke continues heavy, and in the Upper and Lower Connellsville regions is running at the rate of over 360,000 tons a week.

Iron and Steel Scrap.—We note a heavy inquiry for Scrap, and in sympathy with Pig Iron prices on all kinds of Old Material are very firm. Heavy Melting Scrap is held at $16.50 to $17, while dealers quote other grades as follows: No. 1 Wrought Scrap is $16.50; Cast Iron Borings, $9 to $9.50; Bundled Sheet Scrap, $14.25 to $14.50; Old Steel Rails, short pieces, $16; long pieces, $16.50; Machinery Cast Scrap, $15, and Cast Steel Scrap, $15.50, all in gross tons, f.o.b. Pittsburgh.

Edmund W. Mudge & Co. have opened offices in rooms 301-302-303 Frick Building, Pittsburgh, as factors in Pig Iron, Steel, Scrap and Coke. The sales of Pig Iron and Steel will be in charge of Edmund W. Mudge and R. D. Campbell. The Scrap department will be handled by H. N. Trimble and the Coke sales will be in charge of C. B. Ferree. After April 1 this new firm will occupy a suite of five rooms on the tenth floor of the Frick Building annex.

The Lackawanna Steel Company, Buffalo, N. Y., has opened offices in rooms 301-302-303 Frick Building, Pittsburgh, and will be represented in the Pittsburgh district by Edmund W. Mudge & Co.

The Pittsburgh offices of the La Belle Iron Works, Steubenville, Ohio, have been removed from 2011 Farmers Bank Building to rooms 301-302-303 Frick Building, Pittsburgh.

The Bourne-Fuller Company, Cleveland, Ohio, dealer in Iron and Steel products, Pig Iron and Coke, opened a Pittsburgh office on November 1 at 1126 Frick Building. It will be in charge of Norris J. Clarke, who has called on the Pittsburgh trade for this company for some time.

The Montreal Light, Heat & Power Company has installed in its Maisonneuve substation an induction regulator which is believed to be the largest piece of apparatus of the kind in the world. It has a capacity of 5000 amperes at 2400 volts, being designed to raise or lower the pressure 10 per cent.

Cleveland.

CLEVELAND, OHIO, October 31, 1905.

Iron Ore.—Shippers of Ore now have the alternative of relying solely upon contract vessels or advancing the rates for wild boats. They have chosen the latter by paying $1 from Duluth to Ohio ports. The demand for lake tonnage for the movement of both Coal and grain has been so strong that wild rates have risen rapidly. The movement of Ore is fairly rapid, even though cars are scarce for the direct shipment from lake docks to furnace stock piles. Since lake docks are now crowded with Ore it is a question whether much wild vessel room can be employed without entailing congestion. A little talk is heard of sales of Ore for 1906 delivery, but it is still too early to quote prices.

Pig Iron.—Buying has been as heavy as the supply of Foundry Iron would permit. Its scarcity is indicated by the fact that some few lots have been sold for quick shipment at $17 a ton for No. 2 in the Valleys. For first quarter prices are still below that mark, but the available supply is so small that another advance would not be out of keeping with present expectations. On long time contracts some of the furnaces are still selling at $16.50, which seems to be the bottom. The number of furnaces withdrawing from the market for early delivery is on the increase. The Southern furnaces are still selling a little Iron in this territory, quoting $13 to $13.50 for No. 2 Birmingham, to which is to be added the freight of $3.85. The market for the Steel making Irons is quite as strong as that for Foundry. The Bessemer Pig Iron Association met in this city on Thursday, October 26, and decided to sell to the United States Steel Corporation all the Bessemer Iron the furnaces represented could deliver in November and December at $16.50 at the furnace. Some sales have been made during the past week at $16.75 in the Valleys for spot shipment, and the quotation is now $17 at furnace. Many of the producers are still unwilling to make prices until their Coke contracts are closed. The Coke market is still strong, with rising tendencies. The best grades of 72-hour Coke are now selling at $3.75 to $4 at the ovens, while the best grades of Furnace Coke have sold at $3.25 at the oven.

Finished Iron and Steel.—Buyers are running to extremes in the prices now being paid on Structural Steel. Some sales have been made in this territory out of stock at 3c., against the association price of 1.70c., Pittsburgh. The pressure for material is indicated by the fact that some of the largest consumers, unable to get it from even the smaller mills, have been driven to the jobbers. The situation is such that it is not a question of making sales but of the buyers getting what they must have. A few small mills alone have Steel for sale for quick shipment and upon such lots they are able to command about what prices they ask, these being in some instances as high as $10 a ton over the association price. Most of this material is coming into this territory from the Eastern mills. On Plates the larger mills are in better shape to offer deliveries than on Structural. Contract material on the latter is obtainable at association prices only in from six to eight months. On Plates deliveries can be made in four or five months from Pittsburgh, Eastern mills being in even better shape. The supply from the latter, however, is beginning to be scarce and deliveries there are not offered much short of a month, with premiums running from $2 to $4. Bars have become a little easier and even some of the larger mills are now offering shipments on contracts in two to four weeks on smaller sizes, with the price holding steady at 1.50c., Pittsburgh, for both Bessemer and Open Hearth. Specifications against old contracts are especially heavy from the agricultural implement works. The Billet situation is so strong that those having Steel to sell are about able to make their own prices. Forging Billets have sold as high as $32, delivered in this territory, and Bessemer 4 x 4 Billets at $28, Pittsburgh. Most of the larger mills announce that they are out of the market for the time being, which leaves those needing Steel dependent upon the smaller producers. Pipe prices have grown a little stronger. For a while mills to get business for quick shipment were quoting 81 off list. In the main this has been withdrawn. The Sheet trade shows a somewhat stronger tone, although the buying has not been large enough to warrant any advance in prices. The mills are simply hopeful that smaller concerns have been satisfied and are consequently not shading prices as much as they were. The principal business here is done out of stock, with quotations as follows: For No. 10 Blue Annealed, 2.05c.; for No. 28 One Pass Cold Rolled, 2.55c., and for No. 28 Galvanized, 3.55c., as a basis. Bar Iron is one of the strong points in the market. Sales have been made of lots ranging from 1000 tons and upward for forward delivery at 1.75c., Youngstown, while some material for quick shipment has been sold as high as 1.80c., Youngstown.

Old Material.—Buying is heavy. Prices have an upward tendency but have not advanced. The following represent dealers' quotations to the trade for gross tons: Old Steel Rails, $16 to $16.50; Old Iron Rails, $21 to $22; Old Car Wheels, $16 to $16.50; Heavy Melting Steel,

$16.50 to $17. Net tons: Cast Borings, $9.50 to $10; No. 1 Busheling, $14.50 to $15; No. 1 Railroad Wrought, $16.50 to $17; Iron Car Axles, $21 to $22; No. 1 Cast, $14.50 to $15; Stove Plate, $11; Iron and Steel Turnings and Drillings, $11.

Cincinnati.

FIFTH AND MAIN STS., November 1, 1905.—(*By Telegraph.*)

Pig Iron.—The market is very strong and fairly active. Ruling quotations on both Northern and Southern brands are well maintained, with an apparent tendency toward higher prices. It is possible that the unusual strength at this time is largely attributable to the great difficulties that the furnaces of all sections are laboring under in securing a sufficient tonnage of Coke to keep them going, as it is known that in several instances they have been compelled to shut down pending the arrival of a supply. Then, again, the labor situation has become a strong factor in the way of production, reports showing it to be almost impossible to secure what men are absolutely required. For this reason and also on account of most of the furnaces being well sold up into the first quarter of next year there is apparently a very limited offering of the several grades of Iron. The majority of the large producers of the South are holding for $14, Birmingham, but no sales are reported at this figure except in one or two instances where choice brands were wanted, and then only in tonnage so small as to produce no material effect on the market price. It looks as though $13.50, Birmingham, is well established, and while, as remarked before, there may have been some sales at figures above and below this quotation, the offerings were not of sufficient moment to change what we consider a well established schedule. The trade to-day are readily paying for what they need on this basis, but do not see their way clear at this time to go higher. There is apparently less spot Iron offering than at the same time last week, reports showing that it was disposed of during the week at possibly shaded figures. Northern brands are stronger and slightly higher, and as a number of the larger producers are out of the market the supply is somewhat limited. No. 2 is quotable at $16.20 to $17, furnace, for first quarter's delivery. Inquiry for Basic, Malleable and Bessemer is reported as exceptionally heavy, with foundry requirements less active. Gray Forge and the lower grades are said to be quiet, with a limited supply to be had. The report is that one of the largest consumers in this territory is expected to close this week for 50,000 to 70,000 tons of mixed grades. We note an inquiry from a northern Ohio Pipe company for 10,000 tons, delivery to cover first four months of next year, also one from a similar concern in central Ohio for 3000 tons, first quarter delivery. Freight rates from Hanging Rock district to Cincinnati, $1.15, and from Birmingham, $2.75. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1	$16.75
Southern Coke, No. 2	16.25
Southern Coke, No. 3	15.75
Southern Coke, No. 4	15.25
Southern Coke, No. 1 Soft	16.75
Southern Coke, No. 2 Soft	16.25
Southern Coke, Gray Forge	$14.75 to 15.00
Southern Coke, Mottled	14.50 to 14.75
Ohio Silvery, No. 1 (8 % Silicon)	19.40 to 19.65
Lake Superior Coke, No. 1	18.15 to 18.65
Lake Superior Coke, No. 2	17.65 to 18.15
Lake Superior Coke, No. 3	17.15 to 17.65
Car Wheel and Malleable Irons.	
Standard Southern Car Wheel	$19.25 to $19.50
Lake Superior Car Wheel and Malleable	18.50 to 19.00

Coke.—Reports show that the available supply is far short of consumption, largely due to the inability of the railroads to furnish the necessary equipment. The demand is almost unprecedented and the ovens are gradually falling farther behind in contracts. Prices are stiff, the best grades of Connellsville and Stonega Foundry being quotable at $4, at ovens.

Finished Iron and Steel.—Much new business is being constantly booked. The rolling mills are reported as very busy, with prices good. Quotations of last week are unchanged. We quote, f.o.b. Cincinnati: Iron Bars, in carload lots, 1.65c., with half extras; the same in smaller lots, 1.90c., with full extras; Steel Bars, in carload lots, 1.63c., with half extras; the same in small lots, 1.85c., with full extras; Base Angles, 1.73c., in carload lots; Beams and Channels, in carload lots, 1.83c.; Plates, ¼-inch and heavier, 1.73c., in carload lots; in smaller lots, 1.90c.; Sheets, 16-gauge, in carload lots, 2.15c.; in smaller lots, 2.70c.; 14-gauge, in carload lots, 2.05c.; in smaller lots, 2.60c.; Steel Tire, ¾ x 3-16 and heavier, 1.83c., in carload lots.

Old Material.—Business is fairly active, with quotations ruling strong. Considerable tonnage has been sold during the week, and dealers are well satisfied with conditions. We quote dealers' prices, f.o.b. Cincinnati, as follows: No. 1 Railroad Wrought Scrap, $17 to $17.50 per net ton; No. 1 Cast Scrap, $14 to $14.50 per net ton; Iron Rails, $20 to $21 per gross ton; Steel Rails, rolling mill lengths, $15 to $15.50 per gross ton; Relaying Rails, 56-lb. and upward, $24.50 to $25 per gross ton; Iron Axles, $22.50 to $23 per net ton; Car Wheels, $16.50 to $17 per gross ton; Heavy Melting Scrap, $15 to $15.50 per gross ton; Low Phosphorus Scrap, $18.50 to $19 per gross ton.

New York.

NEW YORK, November 1, 1905.

Pig Iron.—There has been a very liberal buying in all directions, in lots running up to 2500 tons of Foundry Iron, and in a number of instances melters have taken considerably more of Iron than their inquiries called for. The market has been firmer, and an increasing amount of business has been done at the maximum figures. There has been further buying of Basic by a Steel mill in this district, about 11,000 tons having been purchased in addition to the 10,000 tons taken last week. We quote for Northern, tidewater, $18.25 to $18.50 for No. 1 Foundry; $17.75 to $18.25 for No. 2 Foundry, and $17.25 to $17.50 for No. 2 Plain. Southern Iron is selling on the basis of $17.25 to $17.75 for No. 2 Foundry, New York harbor.

Steel Rails.—While negotiations for a good tonnage are pending, the question of deliveries being one that now requires some little figuring, large orders have been wanting in the past week. The Delaware, Lackawanna & Western Railroad bought 11,500 tons last week, and a Mexican order for 10,000 tons is reported, other tonnages being for the most part below 10,000. Trolley line business furnishes a steady demand.

Structural Steel.—Inquiries that come to the mills indicate that those who seek to buy are not getting needed deliveries from the mills with which they have contracts, as manufacturers are hearing in a good many cases from consumers from whom they have not had business in a long time. The payment of 2½c. and as high as 3c. for Beams and Channels out of stock is not uncommon. Railroad business that is being figured on is rather slow coming to a head, but indications are that a good volume of bridge work will be given out in November and December. The American Bridge Company was awarded the Ashland and Ironton railroad bridge over the Ohio River last week. About 12,000 tons of Steel will be required. The company closed about 30,000 tons of Structural contracts in October and has prospects for an equally good record for the remainder of the year. We continue to quote as follows, for tidewater deliveries on shipments from mills: Beams, Channels, Angles and Zees, 1.84½c.; Tees, 1.89½c.; Bulb Angles and Deck Beams, 1.99½c.; Beams, 18 to 24 inches, 0.10c. extra; Angles, over 6 inches, 0.10c. extra.

Plates.—Quite a fair tonnage has been booked by local sales agents of Eastern mills during the week. The consumption by local repair shops and other users of Plates is of good volume, owing to the excellent conditions prevailing, and frequent orders are necessary to keep up stock. The Eastern mills are steadily increasing the tonnage on their books and in some instances small premiums are now being obtained for very prompt delivery. Quotations, at tidewater, for shipment from mills are as follows: Sheared Tank Plates, 1.74½c. to 1.84½c.; Flange Plates, 1.84½c. to 1.94½c.; Marine Plates, 1.94½c. to 2.04½c.; Fire Box Plates, 2.04½c. to 2.60c., according to specifications.

Bars.—The market is strong, with more business offered to leading mills than they are willing to undertake for the deliveries specified even at prices which are now current. The leading mills are adhering firmly to 1.84½c., tidewater, while the number of mills willing to sell at 1.60c., Pittsburgh, or 1.74½c., tidewater, is steadily becoming smaller. Steel Bars continue to be quoted at 1.50c., Pittsburgh, or 1.64½c., tidewater, but it is practically impossible to secure early deliveries at this rate.

Cast Iron Pipe.—The city of New York will open bids November 22 for 30,000 tons of Water Pipe, running from 24 inches down. This is in addition to the letting of 7800 tons of 48 and 60 inch Pipe November 8. The general demand for Pipe is still keeping up wonderfully. Buyers are anxiously seeking Pipe for quick delivery and, as stated last week, premiums can easily be obtained by those who are able to supply such a demand. Carload lots are quoted at $27.50 per net ton for 6-inch, at tidewater, for forward delivery.

Old Material.—The market is strong, not only in sympathy with higher prices asked for Pig Iron but also as a result of the very great activity in finished lines. Some notable sales have transpired. Hammered Iron Car Axles have been sold at $28, Old Steel Car Axles at $24 and Old Iron Rails in small quantities at $23.50 and $24, all delivered, in eastern Pennsylvania. Heavy Steel Melting Scrap and Scrap Steel Rails are being sought for by several consumers. Up to the present no large blocks of these grades of scrap have been disposed of, although it is reported on good authority that 1000 tons of Melting Scrap and 1000 tons of Steel Girder Rails have been sold at $17.75 and 1000 tons of Melting Scrap at $18, all at points in

eastern Pennsylvania. Buyers and sellers are still about $1 apart on negotiations for large quantities, but conditions appear to favor the sellers. Two lots of 500 tons each of No. 1 Railroad Wrought Scrap were sold at $22.75, eastern Pennsylvania. A sale of 1000 tons of No. 1 Selected City Wrought Scrap brought about $21.75, delivered, eastern Pennsylvania. A lot of 500 tons of No. 1 Yard Wrought, running about 50 per cent. long and 50 per cent. short, was sold at $20, eastern Pennsylvania. A very urgent demand is noted for Car Wheels, and prices are a little higher than quoted last week. A sale is reported of 500 tons of Wrought and Soft Steel Turnings at $15, eastern Pennsylvania, and 500 tons of Borings at $10.75, same delivery. Approximate quotations are as follows for New York and vicinity per gross ton:

Old Iron Rails	$22.00 to $22.50
Relaying Rails	24.50 to 25.00
Old Steel Rails, rerolling lengths	16.50 to 17.00
Old Steel Rails, short pieces	16.25 to 16.50
Heavy Melting Steel Scrap	16.25 to 16.50
Standard Hammered Iron Car Axles	25.00 to 26.00
Old Steel Car Axles	21.00 to 22.00
No. 1 Railroad Wrought	21.00 to 21.50
Iron Track Scrap	18.25 to 19.25
No. 1 Yard Wrought, long	18.75 to 19.75
No. 1 Yard Wrought, short	16.75 to 17.75
Wrought Pipe	15.00 to 15.50
Light Iron	11.50 to 12.00
Cast Borings	9.25 to 9.50
Wrought Turnings	13.00 to 13.50
Old Car Wheels	17.25 to 17.75
No. 1 Machinery Cast	14.75 to 15.75
Stove Plate	11.75 to 12.75
Malleable Cast	15.25 to 16.25

Metal Market.

NEW YORK, November 1, 1905.

Pig Tin.—The market was firm during the week, owing to the small supplies here and advancing prices from the other side. It reached £150 in London yesterday, but declined £1 to-day, to £149 for spot and £148 7s. 6d. for futures. The London statistics are not considered favorable to the future of the market. In New York the reverse is true; spot stocks are well concentrated and held at a premium. To-day's price is 33c. There will be no large arrivals for the next two weeks, consequently consumers who must have supplies will have to pay a premium for prompt deliveries particularly so as the small amount of metal held here is in strong hands. The following statistics were compiled by C. Mayer, secretary of the New York Metal Exchange:

Deliveries into consumption during October were large, amounting to 3100 tons. The total for the ten months of this year shows an increase of 2400 tons, compared with the same period of last year.

The total visible supply on October 31, 1905, is 618 tons above that of October 31, 1904.

	Tons.
Arrivals at the Atlantic ports amounted to	2,530
Total arrivals since January 1, 1905	32,959
Visible supply October 31, 1905	12,812
Against visible supply September 30, 1905	14,508
Against visible supply October 31, 1904	12,194
Against visible supply December 31, 1904	14,768

Copper.—The dullness that has characterized the market for the month prevailed during the week. The few sales that were made, however, were taken at slightly lower quotations, and there seems to be a feeling among the trade that the situation is not as sound as it should be to maintain prices at or near the 17c. level. For nearby deliveries of both Lake and Electrolytic we quote 16.50c., for Casting Grades 16.25c. While it is undoubtedly true that consumption is going on at an enormous rate, still it must be remembered that production has largely increased during the year, and furthermore the demand from China, which has for a year past taken a large amount of our surplus is now falling off, and there are prospects of but little more business from that source. The exports from North Atlantic ports during the month of October aggregated 17,014 tons, which is not up to the average exports of the past year. The exports for the first ten months of this year are 207,740 tons, as against 205,594 tons during the same period last year. In London standard Copper is unchanged at £71 10s., while futures have advanced slightly to £70 10s.

Spelter.—There seems to have been but little Spelter exported during the present movement, and considering the price here as well as the price in London there is not much prospect for further exports. For spot stocks in New York 6.15c. to 6.25c. is quoted; in St. Louis, 6.10c. to 6.12½c. In London the market is lower at £28 5s. The price of Ore has advanced about $2 a ton, but with good weather the indications are that the heaviest output of the whole year will take place during the next month or six weeks.

Pig Lead.—There is not the hungering after spot stocks that was noticeable a week or two ago. While quotations remain on a basis of 5.20c. to 5.40c. for spot stocks, still inquiries are confined to a few cars. In St. Louis the market is firm at 5.15c., while the London market is silghtly higher at £14 18s. 9d. Reports from the Joplin district state that Lead Ore is at $66 per ton, which is said to be the highest price paid in that district since the close of the Civil War.

Antimony.—The market has again subsided to its customary lethargy, with Cookson's quoted at 12.50c. to 13c.; Hallett's at 12c. to 12.50c.; other brands, 11.50c. to 12.25c.

Nickel.—Large lots are obtainable at 40c. to 45c.; smaller quantities at 50c. to 55c.

Quicksilver.—Flasks of 75 lbs. in 100-flask lots are quoted at the old price of $40 per flask. Domestic orders are held in San Francisco on a basis of $39. The price of Rothschild's as well as second hands in London is unchanged, at £7 2s. 6d.

Tin Plate.—Considerable improvement has been noted at the mills, some good sized orders having been booked. The principal producer continues to quote 100-lb. IC Coke Plates on the basis of $3.49, f.o.b. New York, and $3.30, f.o.b. Pittsburgh. Several mills have been started up lately and the leading interest has now about 65 per cent. of its capacity in operation. In Swansea, Welsh Plates are 3d. lower, at 12s. 9d.

There has just been issued in Germany the twelfth annual issue of the statistics of Copper, Lead, Zinc, Tin, Silver, Nickel, Aluminum and Quicksilver by the Metallgesellschaft and the Metallurgische Gesellschaft A. G. of Frankfort-on-the-Main, Germany, whose representative in this country is the American Metal Company of New York. It is a painstaking piece of work, and the statistics of production and consumption of the metals named is accompanied by terse comments bearing upon developments in 1904 and the first half of 1905, which the great authority of the companies named makes valuable.

Iron and Industrial Stocks.

NEW YORK, November 1, 1905.

The stock market was somewhat depressed for the greater part of the past week, due to the apprehension of international financial complications resulting from the disturbances in Russia. The lowest prices were reached on Monday. The following quotations show the lowest points touched on that day by the most active industrial stocks: Car & Foundry common 38⅝, preferred 100⅜; Locomotive common 65¼, preferred 113¾; Steel foundries common 12¾, preferred 45½; Colorado Fuel 43½; Pressed Steel common 47⅞, preferred 100½; Railway Spring common, 45¼; Republic common 24¾, preferred 94; Sloss-Sheffield common 70; Tennessee Coal 86; Cast Iron Pipe common 37½, preferred 96; United States Steel common 37, preferred 104. A more buoyant feeling prevailed on Tuesday, following the announcement of the great concessions made by the Russian Government to the people. Prices advanced quite rapidly, gains of from $1 to $2 per share being made on most stocks. Last transactions up to 1.30 p.m. to-day were made at the following prices: Can common 11, preferred 71½; Car & Foundry common 41¼, preferred 100½; Locomotive common 71⅝, preferred 116½; Steel Foundries common 13½, preferred 47; Colorado Fuel 46; Pressed Steel common 51¼, preferred 101; Railway Spring common 46½; Republic common 25⅞, preferred 95½; Sloss-Sheffield common 72½, preferred 119; Tennessee Coal 92¼; United States Cast Iron Pipe common 39¼, preferred 96⅝; United States Steel common 37¾, preferred 105.

The Chicago Pneumatic Tool Company has issued a very satisfactory statement of earnings for the quarter ending September 30, as follows:

Profits for the quarter		$241,791.45
Depreciation of plant, repairs and amount written off for experimenting		32,488.29
Remainder		$209,303.16
Bond interest for the quarter	$28,750	
Sinking fund reserve	12,500	
		41,250.00
Profit available for dividend		$168,053.16
Quarterly dividend No. 11		61,137.83
Balance carried to surplus		$106,915.33
Previous surplus		376,898.17
Surplus carried forward		$483,813 50

The Sloss-Sheffield Steel & Iron Company reports the following statement of earnings for the three months ended August 31: Profits from operations, $391,423; from which deduct for depreciations and charges to extraordinary repair and renewal fund, $36,820; net earnings, $354,603; deduct three months' accrued interest on bonds and three months' proportion taxes, $60,000; balance, $294,603; deduct quarterly dividend on preferred stock, $114,000; net profits, $180,603; net profits from operations for first six months of fiscal year to and including May 31, 1905, after deductions for depreciation, &c., interest and preferred stock dividends, $359,967; surplus carried over at end of last fiscal year, $2,330,399; total surplus August 31, 1905, $2,870,969.

Dividends.—Pressed Steel Car Company has declared the regular quarterly dividend of 1¾ per cent. on preferred stock, payable November 23.

American Radiator Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock and 1 per cent. on common stock.

United States Steel Corporation has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable November 30.

New York Pig Iron Warrant Market.

The sale of pig iron warrants and pig iron warrant certificates in the Produce Exchange during the week ending at noon Wednesday was larger than it has been in several months. The total transactions amounted to 7500 tons. Higher prices were established and toward the latter end of the week trade was especially brisk. Two transactions of 1000 tons each of January regular were noted on October 26. The sales were as follows:

WARRANTS.—500 basic Alliquippa, $16.45; 100 No. 2 December foundry, $13.50; 100 No. 2 December foundry, $13.25; 400 Alabama No. 4, $12.25; 1000 Dayton G. F. January, $11.95.

CERTIFICATES.—200 Febuary regulars, $16.70; 1000 January regulars, $16.25; 1000 same, $16.25; 100 cash regulars, $16.65; 500 November regulars, $16.45; 500 January regulars, $16.75; 200 December regulars, $16.80; 200 February regulars, $16.90; 100 same, $16.90; 100 same, $16.85; 100 December foundry, $16.65; 200 November regulars, $16.30; 100 February foundry, $16.70; 200 December foundry, $16.50; 200 February foundry, $16.65; 600 February regulars, $16.50; 100 November regulars, $16.25.

The following prices were established on call Wednesday noon:

	Regular.		Foundry.	
	Bid.	Asked.	Bid.	Asked.
Cash	$16.40	$16.80	....	....
November	16.65	16.80	$16.65	....
December	16.75	16.90	16.85	$17.00
January	16.85	17.00	16.90	17.20
February	16.95	17.10	17.00	17.25
March	16.95	....	17.00	....

The Graham-Phillips Horseshoe & Iron Company.

The Graham-Phillips Horseshoe & Iron Company has been incorporated at Cincinnati, Ohio, with a capitalization of $200,000. The company will make horseshoes and bar iron. The plant will be located on the west bank of the Big Miami River, near Cleves, 16 miles west of Cincinnati on the Cleveland, Cincinnati, Chicago & St. Louis Railroad (Big Four). The company has secured a 60-acre tract of land.

The main building will be of steel, 80 x 360 feet, with other buildings necessary for the conduct of the business. The incorporators are C. E. Hooven, H. Lee Early, Stanley Struble, Charles G. Phillips and Frank C. Graham. C. E. Hooven, general manager of the Cincinnati, Lawrenceburg & Aurora Traction Company, will probably be the president of the company. He is the son of Colonel Hooven, president of the Hooven, Owens & Rentschler Company, Hamilton, Ohio. The general management of the mill and factory will be under the supervision of Charles G. Phillips, for many years connected in the same capacity with one of the largest Eastern mills in the same line of manufacture. The office and sales department will probably be under the charge of Frank C. Graham, who has been the Western representative of some of the largest mills in the East and West. The main office of the company is located at 210 Traction Building, Cincinnati. It is the intention of the company to put the plant into operation not later than April 1.

Malta is getting into line with local transportation facilities, having just established, in addition to its new electric trolley line, a motor omnibus service, the rolling stock of which consists of six electric cars of about 24 horse-power each. Four of these cars have each a capacity for 36 passengers and the others for 17. The company has built a garage for the storage and repair of both its own cars and those belonging to outside individuals, having complete installation for charging batteries, &c. All of the cars are lighted by electricity.

A Gas Engine Driven Single-Phase Railway System.

A rather unique railway system has just been placed in operation between Warren, Pa., and Jamestown, N. Y. One of the most interesting features is the use of horizontal double acting gas engines of the heavy duty type for generating power. Two of these engines are now installed. The system uses alternating current; consequently it is necessary to have the engines operate in synchronism. The service is one in which it is particularly difficult to provide for parallel operation on account of the violent fluctuations in load which occur, due to the size of the cars and the small number in operation at one time. As it was not practicable to use storage batteries to absorb these fluctuations the engines are put to the severest test that could occur in the operation of electric power plants.

The two generating units each consist of a gas engine of 500-brake horse-power, direct connected to a 260-kw. revolving field engine type single-phase generator. The engines have two cylinders arranged in tandem, with a single crank. The engines were built by the Westinghouse Machine Company and the generators by the Westinghouse Electric & Mfg. Company.

The fuel is natural gas, furnished by a local company. In this district the gas has a calorific value of 1000 British thermal units per cubic foot. In the same plant there is also a 55 horse-power vertical Westinghouse engine of the single acting type used to drive an air compressor and an exciting unit for the main equipment.

Labor Notes.

The coremakers in a number of Philadelphia foundries went out on strike on Monday, October 23, their demand being for an advance in the minimum from $2.50 to $2.75 and recognition of the union through dealings with its business agent. The business agent sent a written request to the foundrymen of Philadelphia in September for a conference on the question of wages. The reply was made that the foundrymen believed the question could be handled without the intervention of the business agent in case any of the coremakers were entitled to an advance. The foundrymen are understood to be opposed to an increase in the minimum though willing to advance men whose efficiency calls for an increase.

The Standard Chain Company, whose employees have been on a strike since July 11, is now operating all its plants, including that at Columbus, Ohio. All are now conducted as open shops and the company is operating the same number of forges as were active prior to the strike. It is considered, therefore, that the strike is over so far as any effect upon output is concerned. The men at work have expressed themselves as being better satisfied under open shop conditions than when the same shops were under the control of the Chainmakers' National Union. The working force shows an increase each week and the company is gradually overtaking its orders.

The Chicago machinists' strike, which originally involved about 2800 men and affected 28 machine shops in the Chicago district, was formally declared off this week. The strike was declared May 24, 1904, and the union was practically defeated in less than six months. In the year and a half of the strike 400 men were arrested and 10 injunctions were issued. Under the injunction orders there were 162 arrests and only one man was convicted.

All records for output of steel rails were broken in October at the Edgar Thomson Steel Works of the Carnegie Steel Company, the product being 82,900 gross tons, the average section being 85 pounds. The best previous month's record of the plant was 71,000 tons. The efforts of the men to break the record were appreciated by the Carnegie Steel Company and suitable rewards were made.

The Machinery Trade.

NEW YORK, November 1, 1905.

The machinery trade the past week has been very brisk and there was a noticeable increase in inquiries, partaicularly for the heavier types of machines. Machinery merchants have been greatly benefited by the development of the steel car, and as a result of the growth of that branch of trade large orders for machinery have been and are being placed. The Pressed Steel Car Company has not yet completed the purchase for its new plant at McKees Rocks, Pa., and it is thought that the American Car & Foundry Company, St. Louis, Mo., will shortly enter the market. It was reported last week that the Pullman Palace Car Company intended to go into the manufacture of steel cars on an extensive scale, but this has been denied by directors of the company. While the company does not intend to take up the manufacture of steel cars at this time, there is very little question that eventually it will be compelled to do so. It is the general opinion in the machinery trade that all the principal manufacturers of wooden cars will ultimately go into the building of steel cars, as it is apparent that the use of wooden cars is becoming a thing of the past. The Pullman Company has secured an order for a large number of cars from the New York Central Railroad and has recently purchased some new machinery to increase its facilities.

An unusual impetus has been given to the mining machinery trade during the last few weeks, and it is said that dealers in that line are now experiencing a boom that promises to continue into the winter. Mining operations in the Western States have been particularly active of late and a large amount of machinery has been bought. Those in the trade say that some houses that depend largely on the sale of mining machinery have experienced their best trade during the last few months. Pumping machinery is especially in demand, and the trade in pneumatic rock drills of all sorts has been especially active. New mining properties are being opened constantly, and in addition to the actual operations at the mines many companies are installing smelters or additions to plants already in existence, while refiners are as busy as possible and many are making additions to their plants. It is said that all branches of the mining machinery trade have shared in this prosperity.

It is interesting in this connection to note that the Japanese are liberal buyers in the mining machinery market just now and will continue so for some time to come. Mines in that country which were idle during the war have been put in operation again. This is especially true with a number of extensive copper mines, and the Japanese purchasing houses here have been receiving substantial orders from that country for a varied assortment of mining machinery for early shipment. It is expected that this buying movement will continue for some time, as preparations are being made for extensive mining operations there and general supplies will be needed in abundance. The Japanese are also buying oil machinery in considerable quantities, and the oil properties are being developed there on a large scale.

Trade in Russia is by no means so good as that in the country of its recent antagonist, and several American houses have received word of late to hold shipments of machinery which were ordered some time ago because of the recent disturbances. Other houses doing business with Russia are awaiting advice from that country before sending goods to the points where the disturbances are.

Important Machinery Requirements.

The exceptionally heavy volume of freight business is stimulating the purchasing department of the Pennsylvania Railroad Company to unusual efforts to supply material to keep locomotives and freight cars, of which there is a great scarcity, in service. Large general purchases are being made to indirectly care for the increasing freight business. The reports from the various divisions indicate that the tool programme now being made up will be an unusually heavy one, but owing to the manner of handling the requirements in this direction it is unlikely any definite statement concerning the exact needs will be made until after the first of the year.

The Pennsylvania Railroad Company is still buying cranes, and is now in the market for two 30-ton cranes for Trenton, where some improvements are to be made.

The American Locomotive Company is also in the market for cranes and has inquiries out for two 150-ton cranes for Schenectady, in addition to one 15-ton crane for the same place. It is understood that the company wants the cranes for its locomotive erecting shops at that point.

It is understood that the Boston & Maine Railroad has under contemplation the erection of new shops at Somerville, Mass., and it is expected that the road will shortly come into the market with a list. The trade has been following the Boston & Maine for some time with the idea that a list would shortly be issued, as it is known that some equipment will be required for early delivery in its shops in the vicinity of Somerville and Salem.

The new plant to be erected at Connellsville, Pa., by the Connellsville Machine & Car Company, plans for which are being prepared by the Osborn Engineering Company, Cleveland, Ohio, will include a machine shop 80 x 150 feet, foundry 80 x 105 feet, blacksmith shop 70 x 100 feet and carpenter shop 70 x 120 feet. There will be required two 10-ton and one 5-ton traveling cranes, together with quite an amount of special machinery for the machine shop. It is not likely that power plant equipment will be required.

The W. P. Davis Machine Company, Rochester, N. Y., which is to build a new plant at a cost of $100,000, expects to install a new engine and boiler of from 80 to 100 horse-power, 20-ton traveling crane, with 35 feet span; elevator 7 x 14 feet, to lift from 6000 to 8000 pounds four stories; line shafting, hangers, couplings and pulleys, and a central heating system for the different buildings. The plant will consist of a machinery store 40 x 160 feet, three stories high; main factory building 142 x 160 feet, one story; repair shop 50 x 100 feet, and storage warehouse 40 x 140 feet. A spur from the New York Central Railroad tracks will run through the property, the buildings being erected on either side.

While only a few months ago the Fawcus Machine Company, Pittsburgh, Pa., bought quite a quantity of new machinery for equipping the addition to its plant, it is likely that the company will soon be in the market for additional tools. The company has built up a large business in the manufacture of cut gears of every description, general machinery for rolling mills, axle works, glass factories, &c., and though the addition to its plant has only recently been put in operation, practically doubling the capacity, the company has been obliged to work its force night and day to fill its orders. To take care of its increasing business the company has decided to build another addition and has secured a piece of property alongside of its present ground, where it will erect a two-story machine shop 120 feet long, with offices and wareroom on the second floor.

T. D. Dixon, McKeesport, Pa., who is at the head of the company which is to erect machine shops and foundry at St. John, Kan., informs us that he is now in the market for considerable equipment for the new plant, including one 4-ton belt driven ice machine, one 28 x 28 inch by 8-foot planer, one 24-inch shaper, one tool grinder, one 12-inch and one 30-inch lathe with 6-foot bed, one 30-inch drill press, one 20-inch blower, 150 feet of 2-inch shafting, 14 10-inch drop hangers, one 50 horse-power tubular boiler and one 40 horse-power engine. These are only a few of the machines that will be required, the specifications for the complete equipment having not yet been completed.

Machinery merchants in this territory will undoubtedly secure some good sized orders before very long from the Dressel Railroad Lamp Works, New York, which is to build a new plant 60 x 125 feet, five stories high, on Park avenue. The plant will cost completed about $50,000. M. J. Garvin, the architect, is now laying out the machinery, but we understand that the equipment will be purchased by the Dressel Company. Regarding the heating and power plant it has not yet been decided whether steam or electricity will be used. We understand that none of the machinery has been purchased.

The downtown office of the Henry Bonnard Bronze Company, which is at 49 Wall street, has taken charge of the details of erecting and equipping the company's new plant at Mount Vernon, N. Y. The company now occupies a building at 430-436 West Sixteenth street, and although its plant there is a good sized one, the new plant, it is said, will be the largest bronze casting establishment in the world. The plant will consist of two one-story brick buildings, covering a little more than 2 acres. Work has been begun on the structures which are to be divided into an office, showrooms, foundry, finishing department and power plant. The foundry and finishing rooms will be equipped with six or more cranes, two of which will be of from 20 to 25 tons capacity, and the others will be 10-ton cranes. They will all be used to handle the heavy bronze castings. The equipment will also include lathes, air compressors, drill presses and the like. The power plant will in all probability be of 200 horse-power, and all of the machines will be electrically driven.

Within a few months the plant of Schaeffer & Budenburg, whose offices have been moved from John street to 25 Dey street, New York, will be moved from Brooklyn, N. Y., to Foxboro, Mass. The company has acquired the large plant which was built there for the Van Choate Electric Company, and which has been idle for several months. A foundry about 60 x 150 feet is to be built, and it is expected that the company will move its equipment to Foxboro about next May. In a few months the company will be in the market for machinery equipment which will be needed for the foundry and other parts of the establishment. The Schaeffer & Budenburg Mfg. Company manufactures steam specialties, and the plant at Foxboro, it is understood, will be much larger than the present one at Brooklyn.

The Richmond Forgings Corporation, Richmond, Va., which was organized a few months ago, has purchased the equipment for its shop, but it is already planning for a large increase, which will probably be put in within the next six

months. The location of the plant is excellent for shipping purposes, it being adjacent to the Southern Railway tracks and only 20 feet from the river, which offers ample water supply. The building, which will be of steel, 50 x 100 feet, is being constructed by the Virginia Bridge & Iron Company, Roanoke. For operating the machine shop, forging machines, &c., a 150 horse-power alternating current generator is being installed, which will be run by a turbine water wheel. For operating the hammers the company is putting in a 150 horse-power horizontal return tubular boiler. The equipment includes one 2000-pound, one 1250-pound, one 8000-pound Chambersburg drop hammers, one 2-inch Acme forging machine, two Toledo presses, and the necessary machinery for trimming, grinding and tumbling the forgings. For the die sinking room the company has secured one heavy Woodward & Powell planer, one Fox extension gap lathe, one Steptoe shaper, one Pratt & Whitney milling machine, one Barnes drill press and several smaller presses, one Greenfield grinder, one large surface grinder and various small machines. The company will use oil furnaces in its forge shop, though the type has not yet been decided. As soon as the company gets its steel plant in operation on Belle Isle, which will be inside of two years, it will be largely independent of market conditions.

W. P. Pressinger, manager of the air compressor and rock drill departments of the Chicago Pneumatic Tool Company, New York, left on Wednesday for an extended trip to the Western coast for the purpose of visiting the numerous agencies of the company. On Tuesday Mr. Pressinger will be in Pittsburgh and from there will go to Chicago, St. Louis, Kansas City, Denver, Salt Lake City, San Francisco, Los Angeles and Portland, and will return by the northern route, taking in all the principal cities. It is expected that the trip will have beneficial results with the different agents, who will have an opportunity to get in closer touch with that particular branch of the trade and will be enabled to become more familiar with the advantages of the Chicago Company's tools. The company has recently secured an order for two of its largest compressors and one of smaller size from the Pullman Palace Car Company, Chicago, for quick delivery, and at the present time is crowded with orders, many of which were received from foreign countries. The company notes unusual activity in its air lift department.

The details of the organization of the Stirling Consolidated Boiler Company were completed October 25, at which time the new company formally took over the business of the Stirling Company, whose plant is at Barberton, Ohio, and the water tube boiler department of Aultman & Taylor Machinery Company, Mansfield, Ohio. The main office of the new company is in the Trinity Building, New York.

The Central Pennsylvania Traction Company, Harrisburg, Pa., has sent out specifications for the mechanical equipment for its new power plant, and the bids are now in the hands of the company's engineer, M. D. Pratt, 18 North Third street, Harrisburg.

It will be of interest to note that the plans of the Board of Water Supply for an additional water supply for New York have been approved by the Board of Estimate. The whole project will cost in the neighborhood of $161,000,000, and it is expected that the new system can be carried to completion by 1925.

Bids will be opened by the Department of Health, Fifty-fifth street and Sixth avenue, New York, on Tuesday, November 14, for furnishing and erecting two boilers at the boiler house of the Kingston Avenue Hospital, Kingston avenue and Fenimore street, Brooklyn.

Business Changes.

Alfred H. Schütte, who has a number of branch houses throughout Europe which handle the products of a great many of the important manufacturers of machinery in this country, has opened a branch house at Calle Lauria 18, La Barcelona, Spain. This new establishment will carry a large assortment of modern machinery and tools, and is under the management of Max Daunert, who is also manager of Mr. Schütte's establishment at Bilbao.

The Ingersoll-Rand Company, New York, has established a branch office at Houghton, Mich., under the management of Thomas F. Lynch, who for several years past represented the Ingersoll-Sergeant Drill Company in the copper and iron districts. A full line of drills and repair parts will be carried at this branch, as well as in the Duluth warehouse, which is under the management of the Houghton office.

Owing to the growth of its business necessitating increased facilities the Thomas W. Pangborn Company, New York, on November 1 will establish offices in the Glackner Building, 227-229 Fulton street, and will devote its present premises at 42 Dey street to warehouse purposes.

William A Hawgood and Arthur H. Hawgood of Cleveland, Ohio, closed a contract last week with the American Shipbuilding Company for a steamer having a carrying capacity of 10,500 tons. The new boat will be delivered June 1, 1906.

Chicago Machinery Market.

CHICAGO, ILL., October 31, 1905.

Several of the largest machinery houses on Machinery Row report October sales greater than any month in the past three years, and this record was made in the absence of large lists for railroad and manufacturing requirements. Sales were largely made from store and included replacements and additions and in a few instances equipment for new plants, but in no case did the orders exceed $5000. This indicates the general buying movement throughout the West and which increases in volume from month to month. Inquiries are numerous and the outlook for the last two months of this year is exceedingly bright. Demand for wood working tools has improved very materially in the past few weeks and several of the largest Western manufacturers are unable to promise deliveries in less than three months. There is no abatement in the demand for second-hand equipment of all kinds and dealers continue to experience considerable difficulty in securing desirable tools. Manufacturers of new machinery continue behind on deliveries, and on large tools, such as the extreme sizes of planers and boring mills, shipments cannot be promised in less than four to six months.

While the Chicago, Burlington & Quincy Railroad purchased the bulk of its machinery requirements nearly two months ago contracts for several of the largest tools, including wheel lathes, &c., have not yet been placed and it is probable that the purchase of these tools will be delayed until after the first of the year.

In connection with its $150,000 improvement at Lorain, Ohio, the Baltimore & Ohio Railroad Company intends to construct a 15-ton locomotive crane and it is probable that the contract will soon be awarded.

Kahlenberg Bros., engineers and machinists and manufacturers of gasoline engines, Two Rivers, Wis., are having plans prepared for a new machine shop, power house and pattern vault. Contracts for the erection of the buildings will be let during the winter and work begun as early in the spring as weather permits. Requirements include a boiler, engine, electric light plant, pumps, lathes, milling machines, horizontal boring mill and power transmission apparatus.

The Snyder-Taylor Elevator Company, Columbus, Ohio, is in the market for a ¾ x ¾ inch punch press, not less than 8-inch throat, and a 36-inch by 25-foot bed screw cutting engine lathe.

O. L. Allen, Battle Creek, Mich., is in the market for one universal milling machine, No. 2 or 3; one 30-inch planer and one 30-inch lathe.

The Banta Furniture Company, Goshen, Ind., is in the market for one cut off saw, one rip saw, one planer and one shaper.

The Specialty Mfg. Company, Lafayette, Ind., has purchased a site upon which will be erected a plant for the manufacture of its automatic railroad switches and other devices to be used on electric roads. The company was recently incorporated with a capital stock of $10,000,000. The officers are Wm. P. Jester, president; Charles E. Kendall, vice-president, and William R. Smith, secretary. Details of power and machinery requirements for the proposed plant are not yet perfected.

The American Can Company will rebuild its plant recently destroyed by fire at Davenport, Iowa. Clausen & Clausen, architects, have been selected to draw plans and prepare specifications.

F. E. Pfannmueller & Co., Chicago, report the sale of a 45-ton 1½-yard Bucyrus steam shovel to a brick company in Chicago and of a 150 horse-power boiler to Peoria, Ill.

Contracts for the large cement plant which the Kansas Portland Cement Company, Iola, Kan., will build at Independence, Kan., have just been let and involve some good sized installations. The contract for furnishing all the power transmitting machinery was let to the Dodge Mfg. Company, Mishawaka, Ind. Two power houses will be erected. The power used in power house No. 1 will consist of a cross compound condensing engine of 1600 horse-power, connected to line shaft by a rope drive of the Dodge American system. There will be eight 22-foot Allis-Chalmers tube mills and seven three-roll Griffin mills. Power house No. 2 will contain one 1600 horse-power cross compound condensing engine and one 800 horse-power, the smaller one being used for the electric generators. The grinding outfit will consist of ten Allis-Chalmers 22-foot tube mills and seven three-roll Griffin mills. The plan of the power distribution will be accomplished by three 500 horse-power rope drives and four 250 and 300 horse-power drives. The contract for the transmission machinery was negotiated by C. M. Collins, consulting engineer of the Dodge Company. The United Iron Works Company, Springfield, Mo., received the contract for machinery used in the manufacture of the cement, amounting to about $113,000. Among other items included in this contract are ten large rotary kilns, each 9 feet in diameter by 110 feet long. In addition to these kilns there will be slurry tanks and other apparatus which will require

about 300 tons of steel plates. The plant is expected to be in operation about February 20, 1906.

Power Work.

The South Park Commissioners, Chicago, are having plans prepared for an addition to the electric light plant at Fifty-seventh street and Cottage Grove avenue. The commissioners also expect to reconstruct the central electric light plant within two or three years at a cost of $220,000. This plant would have sufficient capacity to light the entire park system.

The Merchants Refrigerating Company, Kansas City, Mo., will build a power plant which will furnish 400 to 450 tons refrigerating capacity. Engineers are at present at work on the improvement and bids will be asked within a short time on the equipment.

The Summers Fibre Company, Port Huron, Mich., has under way the erection of a factory building for the making of green flax binder twine from unretted American flax straw. Spinning machinery has been purchased abroad and other needed equipment is now under consideration. A cross compound condensing engine with the ordinary power equipment accessories will probably be purchased. The Chicago office of the company is in the First National Bank Building.

Philadelphia Machinery Market.

PHILADELPHIA, PA., October 31, 1905.

Business in the Philadelphia machinery market during the month of October showed a material increase over that of the preceding month, notwithstanding that the demand was generally weak during the early weeks of the month. Sales of machinery and tools during the last half were much improved and aided materially in bringing the total business up to a good volume. The character of the business taken remains unchanged. Specifications for any large quantity of tools or machinery for any single equipment are still notably absent, and the business taken has been confined largely to a quantity of orders for a small number of tools. In some cases complete equipment for small plants requiring a few tools, such as a lathe ranging from 12 to 16 inches, a shaper, a drill, a hack saw and probably one or more other special tools, have been sold, but even these have not developed in any number. There has been, however, a better demand recently for the lighter variety of machine tools and sales of tools of this class have been numerous. A satisfactory business continues to be transacted in the various heavy machine tools and in special machinery, but the increase has not been as noticeable as has been the case in the medium and smaller tools.

Manufacturers are, almost without exception, exceedingly busy, and a number of plants are being operated overtime in order to keep up even with the present delayed deliveries, which in many cases are daily becoming more extended, and on certain classes of tools are not to be had inside of six months' time.

Inquiries for all classes of tools continue to be received in good volume, and if any kind of reasonable delivery can be made by the seller little difficulty is, as a rule, experienced in closing up the business.

There is a further improvement noticeable in the foreign demand. Inquiries have recently been received by a number of manufacturers of machine tools from prospective purchasers in Russia, Japan, England and China, and some good business for export has already been booked. Manufacturers transacting a more or less regular business abroad are receiving more substantial orders, and the general feeling in view of existing conditions abroad is that this trade should now steadily improve.

The demand for the smaller engines and boilers has not been as good as manufacturers and dealers would like. For certain lines there has been a very light demand and this branch of the trade could stand material improvement. Dealers in second-hand machine tools report a better demand, brought about no doubt by the inability of purchasers to get prompt deliveries on new tools, while the second-hand goods can be delivered immediately and will serve at least the temporary requirements of many of the purchasers.

The foundry trades continue busy, steel casting plants being as a rule the most active, although some of the gray iron foundries have as much tonnage as they can conveniently handle. Some plants are experiencing trouble at the time with their labor, but it is not expected that any serious results will develop from present conditions.

The Hess Machine Works, manufacturer of file making machinery, finds an increased demand both from the foreign and domestic trade. This company has recently shipped three sets of file making machines to England and one set to Germany, while a number of sets have also been shipped abroad through various export houses. The various departments of the plant keep quite busy both on file making machinery as well as on special tools, for which there has been an equally good demand.

The Espen-Lucas Machine Works has recently made some heavy shipments of cold saw cutting off machinery, including among others a special forge saw carrying two blades for sawing out crank shaft forgings, and several heavy steel foundry saws. A special crank shaft forming machine has been furnished an eastern Pennsylvania customer and several saw grinders have been shipped various other parties. This company notes an increased demand for cold saws from both foreign and domestic sources, and a number of orders have been booked for early delivery.

The Newton Machine Tool Works notes an increased demand for its various machine tools, particularly, however, for cold saw cutting off machines, milling machines and slotting machines. Foreign orders have been larger during the past month than in any for six months back, and a further increase is anticipated in this trade. Recent deliveries of tools include a number of medium sized cold saw machines and heavy steel foundry saws. Several milling machines and a number of slotting machines have also been furnished parties in Eastern territory, while several key seat cutting machines have been delivered parties abroad.

Manning, Maxwell & Moore, through their local office, report a very satisfactory condition of trade, the past month having brought out some good railroad orders, as well as general equipment. Inquiries are good and presage a continuance of present active conditions. This company has recently closed a contract with the Harlan & Hollingsworth Corporation to furnish a number of tools for that company's new boiler plant, and has also taken orders for a number of tools both for export and domestic delivery. Turret lathes have been in particularly good demand, and five were sold during the last week in the month. Small drills and lathes have also been sold quite largely, while a fair demand for heavy tools was also noted by them.

The Link Belt Engineering Company has taken a number of orders for coal handling and storage machinery, including a locomotive coaling station for the Pennsylvania Railroad at Lancaster, Pa.; coal handling plant for the Philadelphia Rubber Works, this city, and a coal and ashes handling plant at the Aspinwall filtration plant for the city of Pittsburgh. A number of retail coal pockets have also been equipped with elevating and conveying machinery and orders for general machinery are being received in good number. The company's estimating department is busy on a number of inquiries, and all departments of the plant keep actively engaged.

The Eynon & Evans Mfg. Company notes a large increase in business during the past month. Steam jet blowers are in good demand, and a number have been furnished the different steel plants. The demand for acid resisting bronze castings and other specialties used in the coal fields has improved, and some good business of that class has been booked. Several good orders for surface condensers have also been recently taken, including two for use in connection with 500-kw. steam turbines and another for use with a 1000-kw. steam turbine. All departments of the Eynon & Evans Mfg. Company are actively engaged, and conditions are considered favorable by this company for a continuation of the present active business.

The E. H. Mumford Company, manufacturer of foundry machines, has taken on considerable new business, particularly in 12-inch power ramming and split pattern molding machines. The volume of business being taken by this company is increasing steadily and it is now quite busy on orders for machines of various types. A number of 12-inch power ramming as well as split pattern machines have been recently shipped to New England and local parties, and others will be ready for delivery at an early date.

Wickes Bros., through their local office in the Philadelphia Bourse, report an improved demand for air compressors and engines of the smaller type. The past month's business has, on the whole, been considerably better than that during September, and every indication points toward a continuation of the present activity. Recent deliveries include a 100-kw. generator, direct connected with a 16 x 16 inch Payne automatic engine, for J. Evanson & Sons, Camden, N. J., and several air compressors for various nearby parties.

The city of Philadelphia, through the Department of Public Works, is advertising for proposals to furnish ten tubular boilers, 200 horse-power each, to be located at the Belmont filtration plant for the purpose of furnishing additional power for the pumping engines located at that point. Bids for the above will be opened by the chief of the Survey Department Friday, November 3.

The widely published statements concerning plans for the erection of a steel plant by the Sloss-Sheffield Steel & Iron Company of Birmingham, Ala., are at least premature. We are advised that nothing definite has yet been determined regarding the building of such a plant. The matter has been discussed, however, by the directors of the company.

Cincinnati Machinery Market.

CINCINNATI, OHIO, October 31, 1905.

The past week has been quite active in machinery circles and builders of tools are kept busy along all lines. That foreign demand is largely responsible for the condition of the order books goes without saying, and were it not for this one fact we fear that conditions would be entirely different. Japanese orders are coming forward with a great degree of regularity and a number of the concerns are now engaged in building tools that are to be shipped to that country as rapidly as they can be completed. It will be remembered that for a number of years Germany has been exceedingly quiet in the way of orders, doing very little business with this country. The situation is now changed, however, and the German machine tool builders are awake and apparently anticipating conditions as it is expected they will exist during the next year. Report is that we are now doing a very large business with these people, whom it is believed are stocking up before the change in the duty becomes effective, which will give them a better opportunity of disposing of what stock they may have on hand at this time.

The tour of the Industrial Bureau inspecting the manufacturing interests of Cincinnati and vicinity, mention of which was made in these columns a week or two since, was made on the 24th inst., and proved of inestimable benefit to all concerned. It now looks as if the steel casting plant, which has been under contemplation for some months was an assured fact, as the stock necessary for this project has practically all been subscribed. We hope to have more definite information in a week or two. The party made its first stop at Cullom's Riffle Dam, about 10 miles west of Cincinnati, where the Government is expending $1,000,000 in building a movable dam, which will permit a 9-foot stage of water for 15 miles east and 10 miles west of the city, thus allowing coal, coke and other commodities essential in the development of the city's manufactures to be unloaded without regard to the condition of the river. A visit was next made to the plant of the United States Cast Iron Pipe & Foundry Company at Addyston. This plant covers 100 acres of ground and employs about 900 men.

The Smith & Nixon Piano Company, at Norwood, has decided to add considerable floor space to its present plant and will probably be in the market for additional lines of wood working machinery.

The Graham, Phillips Horse Shoe & Iron Company, incorporated under the laws of Ohio on the 25th inst., is another result of the workings of the Industrial Bureau. The company is capitalized at $200,000, and was incorporated by C. E. Hooven, H. Lee Early, Stanley Struble, Chas. G. Phillips and Frank C. Graham. The plant will be located on the west bank of the Big Miami River, near Cleves, Ohio. The company has secured a 60-acre tract of land adjoining the Big Four Railway and the Cincinnati, Lawrenceburg & Aurora Traction line. Ten acres of this tract will be used by the company for buildings and switches, the remainder to be subdivided into lots for the accommodation of employees and others. The plant at the start will employ from 100 to 150 people, the majority of whom will be expert mechanics brought here from other points. The main building will be of steel throughout, 80 x 160 feet, with such other buildings necessary to conduct the business. C. E. Hooven, general manager of the Cincinnati, Lawrenceburg & Aurora Traction Company, has been elected president, and Chas. G. Phillips, general manager, who has for several years occupied a similar position with one of the large Eastern manufacturies. Frank C. Graham is secretary and treasurer. The main office of the company is located at 210 Traction Building, Cincinnati. It is the intention of the management to have the plant in full operation by April 1 next year. We understand that it is not the intention of the company to operate a merchant bar mill, but simply to supply its own demand. The plant will be entirely new and modern in its equipment, and will consist of rolling mill, special machinery for operating standard bar mill, three vertical waste heat boilers, pumps, electrical apparatus, lathes of several sizes and shears for all of which the company is now in the market.

The Pothoff & Frey Iron Company, now located at Front and Lawrence streets, has secured a site at Front and Harriet streets, where it will at once begin the erection of a new plant. The main building will be of steel and brick construction, 92 x 188 feet; office and drafting building, 25 x 75 feet, and a large power plant building. It will probably be in the market for a number of tools later, among which we mention a facer and electric crane.

The J. A. Fay & Egan Company reports the wood working machinery business in excellent condition. Foreign trade is holding its own and domestic inquiry is very brisk. It is sending its products all over the world, but South America is offering an especially rich field. Trade with Russia and Japan is on the increase, and with the duty taken off it is expected that shipments will be enormous.

Smith & Mills have been adding a number of new tools to their equipment and have been enabled to increase their output considerably. Trade with Japan is still good, a shipment being made last week for Yokohama of a number of shapers.

The Rahn-Mayer-Carpenter Company reports a heavy export trade generally. It has received several orders from the Government for navy yard tools. The Pacific Coast inquiry is reported good, several large shipments having been made to this section recently.

Work has started on the terminal repair shops of the Cincinnati, Hamilton & Dayton Railroad Company at Ivorydale, Ohio, which is the freight terminal yard. These buildings will consist of a concrete engine house of 14 stalls, repair and erecting shop for locomotives of five stalls, 125 x 250 feet, of brick and structural steel; blacksmith shop of brick, 50 x 75 feet; power house, 50 x 75 feet, of concrete and steel; office building, 40 x 100 feet; concrete oil house, 30 x 30 feet, and a wood working shop, 30 x 70 feet. This plant will receive a full complement of new tools, a portion of which has already been secured from Manning, Maxwell & Moore.

The Ahrens Fire Engine Company has just turned out its first engine, made for East St. Louis, Ill. Orders are booked from Indianapolis, Cincinnati, Louisville, Charleston, W. Va.; Degraff, Ohio, Galion, Ohio. A new 21-inch drill press and a large saw have been recently added to the equipment of the plant. Other new tools will be added as necessity demands. The contract for a complete nickel plating outfit has been placed with a Chicago concern.

The Bollman-Wilson Foundry Company has added a new industry to its regular foundry trade. It is now manufacturing for the Superior Tool & Supply Company dough and meat mixers, which are finding a ready sale all over the country as far north as Winnipeg. The company has found it necessary to secure larger quarters to accommodate the increase along this line and has all arrangements made whereby it can increase present floor space of about 1200 square feet to about 15,000 square feet. Considerable new machinery will be required in making this change, which will be in the near future. General foundry trade is reported as improving.

Greaves, Klusman & Co., have added a number of new tools recently and increased their output very materially. Export trade is reported as fair only, with domestic inquiry on the increase.

The Cincinnati Machine Tool Company reports having shipped five machines during the week for points in Russia, with European demand good generally.

The Bickford Drill & Tool Company says that its foreign business is very heavy, especially with France, Germany, Italy and the Continent generally. At home there is a good, healthy condition among the railroad buyers and considerable trade is the result. The automobile interests of France are evidently heavy purchasers of its tools and trade from this source has been excellent.

New England Machinery Market.

WORCESTER, MASS., October 31, 1905.

Local demand for machine tools has been somewhat duller during the past week, according to Boston dealers. They are unable to account for it, excepting on the ground that it is merely a coincidence of postponed action on the part of buyers, and they expect to see things equalized shortly by enough additional business to make up for a slight depression in orders. The manufacturers find no such condition of a falling off, the reverse being the fact.

The machine tool dealers of the small cities look to the new agreement between the National Machine Tool Builders' Association and the committee of the dealers for exclusive territorial rights as being to their advantage. Where the small city dealer has the agency of a given tool, territorial rights must go with it, it is claimed, and where they do, the dealer will be rid of the inroads which the jobbers of the large cities have often made, especially upon large orders. If the distribution of agencies remains as it is the small dealers will have the advantage. This is an interesting side of the general question of territorial rights. As it is generally understood by the manufacturers of machine tools, as well as by at least a part of the general trade, the machinery dealers who confine their business to some one city and its immediate vicinity will have the exclusive right to sell the tools which they carry in those territories. Taking New England as an example, on certain makes of tools the Boston dealers will find the rule a restriction to their business. Providence has several dealers who carry standard lines of tools, and Providence is an important center, especially for small machines such as are used by manufacturing jewelers, and the market for the larger tools is not a small one. The same general conditions exist to a lesser extent in other cities where there are dealers. If these houses continue to carry their present lines, and if the exclusive territorial rights agreement will drive from their market the Boston and New York dealers

so far as these lines are concerned, then the business will be robbed of a source of much friction as to commissions, in which disputes the manufacturers have had to participate to their everlasting annoyance. This is especially true in thickly populated manufacturing sections of the country where the comparatively large centers are geographically close together. On the other hand, there seems to be no doubt that in some instances the small city dealers must become sub-agents, dividing commissions with the large dealers in whose general territories the cities are located. The manufacturers will certainly profit by getting rid of a lot of annoyance in deciding the question of who is entitled to commissions.

One cause of dispute will remain under the agreement. When the main office of a customer is located in New York, for example, and the works are located elsewhere, perhaps in New England, the question of commission will be open to dispute. An order may be worked up by a New England agent with the shop superintendent, but the actual order may be placed in New York. The manufacturer of the tools sold must adjust the matter of commission. But on the whole the question has been very much simplified by the exclusive territorial rights agreement.

The jewelry manufacturing business of Providence, Attleboro and vicinity, which buys large amounts of small machine tools, has revived after a period of depression which did not end until after most other lines had assumed prosperous proportions. Little buying of tools has been done by the jewelers for some time, and the new condition will be welcomed by a good many manufacturers of machinery and other equipment which go into these factories.

Consolidation of Waterbury Interests.

The business heretofore conducted by the Benedict & Burnham Mfg. Company and the Holmes, Booth & Haydens Company, both of Waterbury, Conn., has been amalgamated and will hereafter be conducted under the name of the Benedict & Burnham Mfg. Company. The mills at Waterbury, Conn., formerly operated by the Holmes, Booth & Haydens Company for the manufacture of sheet brass, copper and German silver, brass rods and wire, seamless brass and copper tubing, bare and insulated copper wire, &c., will hereafter be operated by the Benedict & Burnham Mfg. Company. All contracts and orders for material placed prior to November 1 with the Holmes, Booth & Haydens Company will be assumed and billed by the Benedict & Burnham Mfg. Company, but all accounts due the Holmes, Booth & Haydens Company should be paid to it direct.

The New York Engineering Company, Boston, has been organized to conduct a ship repair business. The company is not ready to make announcement of the exact location of its works, but it will be in the vicinity of Boston. An entire new machine shop equipment will be purchased, this matter being in charge of A. F. Bremmer, care the Boston Engineering Company, India Wharf, Boston. The company has been incorporated in Massachusetts with capital stock of $10,000. The officers are: President and treasurer, A. F. Bremmer, clerk, George T. Shannon; directors, A. F. Bremmer, John W. McGrath, Herbert W. Bromley and Richard Minton.

The Commonwealth Machine Company, 6 Walnut street, Worcester, Mass., has been organized to put on the market a line of sheet metal working machinery, including a universal sheet metal cutter. The company has a capital stock of $10,000. It is not planned to manufacture at the outset, but to have the machines built outside. The particular purpose of the machines and devices included in the line is for making cornice work, the claim being that there is a comprehensive field for this class of tools, because there are few machines for the purpose on the market.

H. B. Conant, Skowhegan, Maine, who has established a machine shop for general repair work, is in the market for an upright drill of light capacity. He has also undertaken the manufacture of the Maine ball cock, for which work a lathe is required which must be of the turret type and must also have a chasing bar attachment with a stop threading arrangement. Mr. Conant states that he has not been able to find such a machine and that he would like to do so. He plans to do brass casting later on, and will then be in the market for the necessary apparatus, including furnace, crucibles and handling appliances.

The Hendee Machine Company, Springfield, Mass., which had contemplated moving elsewhere to secure larger quarters, has taken a larger shop in that city. The company states that it does not anticipate adding to its equipment for four or five weeks to come.

The Worcester Steel Works property, Worcester, Mass., has been purchased by the Worcester Cold Storage & Warehouse Company, which will erect a large cold storage plant on the premises. The power plant will occupy a building 50 x 90 feet. The company will be in the market for the necessary refrigerating apparatus, including engine, two 120 horse-power boilers and compressors.

As a result of the increased capacity of the Charlestown Navy Yard the Navy Department has ordered the comprehensive repairs planned for the armored cruiser New York to be done at the yard, the items including $375,000 for the equipment and steam engineering departments, $650,000 for the department of construction and repair and about $250,000 for the ship's battery, which will be shared with the Washington shops. It is thought that the work will require the greater part of two years. This is by far the largest work ever assigned the Charlestown Yard.

The William A. Hardy & Sons Company, Fitchburg, Mass, has not completed its plans for the new plant which it is proposed to build in the spring at South Fitchburg. It is settled that a shop for the manufacture of screen plates for use in paper mills will be built, the company's present facilities for this department being inadequate, and the new shop will require some light traveling cranes and new machine tools. Probably the brass foundry will also be built next year, replacing that now occupied in Fitchburg near the center of the city, but this is not fully determined. The company does general brass and composition metal business.

The Worcester Consolidated Street Railway Company, Worcester, Mass., has decided not to equip its Leominster power station with steam turbines, as at first contemplated, but in their place to install an engine and boilers now located in other stations. Two 300 horse-power Sterling boilers will be added to the equipment of the main power station at Worcester.

Government Purchases.

WASHINGTON, D. C., October 31, 1905.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until November 14 for the following machine tools for the League Island and Norfolk navy yards: Schedule 197, tenoning machine, cut off saw, turntable; schedule 198, metal separator, oil separator, pipe cutting machine, planer and lathe.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until November 21 for a quantity of supplies for the Pensacola Navy Yard, including schedule 213, motors, pneumatic tools, &c.

The Bureau of Supplies and Accounts will receive bids until November 14 for a quantity of material for the Eastern navy yards, including hydraulic jacks, motors, &c.

The Quartermaster, United States Marine Corps, Washington, D. C., will receive bids until November 10 for the construction of a water system for the marine barracks at the Norfolk Navy Yard, including pumps, fire system, drainage system, &c.

The following bids were opened October 20 for generators for the New York Navy Yard:

Bidder 1, Crocker-Wheeler Company, Ampere, N. J.; 2, General Electric Company, Schenectady, N. Y.; 3, Holtzer-Cabot Electric Company, Brookline, Mass.; 4, Northern Electrical Mfg. Company, Madison, Wis.; 5, Roth Bros. & Co., Chicago, Ill.

Class 1. Five motor generators—Bidder 1, $3397.80; 2, $4015; 3, $3990; 4, $2958.70; 5, $3906.

Class 2. Twenty-three motor generators—Bidder 1, $9106.85; 2, $10 812; 3, $9250; 4, $6692.06; 5, $9818.

Bidder 4 submitted alternate propositions, as follows: On class 1, $2943.10, and on class 2, $6599.

The following bids were opened October 24 for supplies for the navy yards:

Bidder 23, William W. Clark & Son, Baltimore, Md.; 38, R. W. Geldart, New York; 47, Handlan-Buck Mfg. Company, St. Louis, Mo.; 55, J. B. Kendall, Washington, D. C.; 63, Montgomery & Co., New York; 70, Manhattan Supply Company, New York; 83, Oliver Machinery Company, Grand Rapids, Mich.; 86, S. M. Price Machinery Company, Norfolk, Va.; 91, J. B. Roache, New York; 100, Sherman-Brown-Clements Company, New York; 107, Smith-Courtney Company, Richmond, Va.; 126, John D. Westbrook, Norfolk, Va.

Schedule No. 167.

Class 55. One pipe bending machine—Bidder 70, $99.50.

Schedule No. 168.

Class 79. One wood turning lathe—Bidder 83, $280; 107, $279.

Schedule No. 172.

Class 135. Twelve hydraulic jacks—Bidder 23, $514.40; 38, $296.74; 47, $449.10; 55, $475.50; 63, $490.50; 86, $411; 91, $465; 100, $511.74; 107, $534.54; 126, $499.50.

Under bids opened October 3 for machinery for the navy yards Tatum & Bowen, San Francisco, Cal., have been awarded class 2, two swinging lathes, $1642.

Under bids opened October 20 by the Isthmian Canal Commission, serial No. 280, Mann & McCann, Chicago, have been awarded item 4, six earth spreaders, at their bid of $23 382, delivery to commence in 75 days and be completed within 115 days.

Under serial No. 274, opening of October 4, the Isthmian Canal Commission has made the following awards:

Bucyrus Company, South Milwaukee, Wis., Class 2, 19 steam shovels; Lidgerwood Mfg. Company, New York, class 3, six unloaders; Marion Steam Shovel Company, Marion, Ohio, class 4, 12 unloading plows.

The following awards have been made for supplies for the various navy yards, bids for which were opened October 10:

J. W. Cregar Agency, Philadelphia, Pa., class 21, one triple geared engine lathe, $1250; class 23, one emery wheel grinding lathe, $85; class 38, one pipe bending machine, $125.

Fairbanks Company, New York, class 22, one lathe, $575.

Baird Machinery Company, Pittsburgh, Pa., class 24, one engine lathe, $940; class 31, one magnetic metal separator, $105.

Oliver Machinery Company, Grand Rapids, Mich., class 25, one belt driven wood lathe, $595; class 34, one belt driven band saw, $351.

Geo. Garton Machine Company, Racine, Wis., class 26, one engraving machine, $944.50.

Prentiss Tool & Supply Company, New York, class 28, one vertical drill press, $159.

Manhattan Supply Company, New York, class 29, one single spindle sensitive drill press, $42.85.

Camden Iron Works, Camden, N. J., class 32, one hydraulic shaft straightening machine, $990.

H. A. Rogers Company, New York, class 33, one hydraulic shaft straightening machine, $192.

Fox Machine Company, Grand Rapids, Mich., class 35, one hand planer and jointer, $185.

Erie Foundry Company, Erie, Pa., class 36, one single frame steam hammer, $748.

Sherman-Brown-Clements Company, New York, class 37, one hydraulic pipe bending machine, $296.90.

Detrick & Harvey Machine Company, Baltimore, Md., class 39, one belt driven drilling and boring machine, $2109.

Niles-Bement-Pond Company, New York, class 40, one boring and turning mill, $1690; class 41, one belt driven radial drill, $1025.

Royce & Ricketts, Washington, D. C., class 42, one universal radial drill, $1500.

Brown & Sharpe Mfg. Company, Providence, R. I., special universal milling machine and one special fixture, $2780.

Under bids opened October 17 for supplies for the various navy yards the following awards have been made:

Hallidie Machinery Company, Seattle, Wash., class 11, three air hoists, $251.

Hyde Windlass Company, Bath, Maine, class 47, three windlasses, $2625.

Lucas Machine Tool Company, Cleveland, Ohio, class 168, one boring, drilling and milling machine, $2440.

Trade Publications.

Valves.—Crane Company, Chicago, Ill. Advance circular 8 AERV. Contains a description of the construction and action of the Crane automatic exhaust relief valves. These are made in vertical, horizontal and angle patterns and are suitable for reciprocating or turbine engines operating condensing only. They provide a means of relieving a condenser when the vacuum is lost. Price-lists are given in the circular.

Hand Cranes.—Niles-Bement-Pond Company, 111 Broadway, New York City. Circular. Illustrates and briefly describes single and double I-beam hand cranes; also gives dimensions and capacities.

Roll Jaw Crushers.—Sturtevant Mill Company, Boston, Mass. Folder. Particularly issued to show the relative fineness with which large, hard rock may be crushed in roll jaw crushers. Description of the crusher is given.

Electric Railways.—Railway Electric Power Company, 114 Liberty street, New York City. Catalogue. Size, 11 x 14 inches; pages, 30. Sets forth the characteristic features and advantages of the Ganz three-phase alternating current traction system, with particular reference to the results obtained from its use abroad. In the preface the history of the development of the Ganz system is given and a comparison of this system with other electric traction systems and with steam systems. This is followed by a very complete description, profusely illustrated, of the "Valtellina Line," erected by Ganz & Co. of Budapest.

Small Motors.—Crocker-Wheeler Company, Ampere, N. J. Bulletin 60, superseding Bulletin 42. Lists a line of small motors known as Form L, ranging in sizes from ¼ to 3 horse-power.

Surfacing Tools.—Lutz Tool Mfg. Company, Springfield, Ohio. Pamphlet. Contains illustrated description of a line of special surfacing tools, including scrapers, scraper holders, adjustable scrapers, universal scrapers, surfacing file holders and universal file holders. The universal scraper was described in *The Iron Age* October 5, 1905.

Electric Controllers.—Westinghouse Electric & Mfg. Company, Pittsburgh, Pa. Circular 1108. Describes a line of regulating and reversing controllers for electric motors, particularly in connection with their driving of elevators, cranes and machine tools.

Steam Heating.—Warren Webster & Co., Camden, N. J. Circular. Contains a little account of the success of the Webster system of steam circulation, citing as a special proof ten orders from one manufacturer in a period of eight years.

Dump Cars.—Kilgore-Peteler Company, Thirtieth avenue, S. E., Minneapolis, Minn. Catalogue. Size, 6 x 9 inches; pages, 31. Devoted to dump cars for various classes of service. It first describes in general the construction, entire and in part, with a special reference to the patent mechanism for dumping. The cars are made to dump to either side or to one end. For general work, such as steam shovel or hand work, cars are made with steel frames and wooden body in various capacities and for various track gauges. For mines, trestle filling and stone quarries a gable bottom car is made which is tripped by a block on the track. The end dumping cars are particularly intended for mine use. Special cars include those for timber, brick, coal, cement, ore, stone, &c.

Oil Filters.—Burt Mfg. Company, Akron, Ohio. Catalogue. Size, 6 x 9 inches; pages, 48. Discusses the advantages of saving waste lubricating oil and gives very complete descriptions of the Cross oil filter, which has been made for about fourteen years, and the development of the American oil filtering system, with which the unit type of filter is used. This last was described in *The Iron Age* October 5, 1905. A description is also given of the regular pattern American filter and the Warden oil filter. Specifications of the sizes of the different filters and their principle dimensions and prices are tabulated. The latter part of the catalogue contains a description of the Burt and Standard exhaust heads.

Large Machinery.—Willamette Iron & Steel Works, Portland, Ore. Three hanging cards. These show respectively a 26 and 53 x 36 inch compound direct connected electric lighting engine of 2200 horse-power, a 36-inch gang saw mill and a Willamette crack-a-jack logging engine.

Saw Grooving Heads.—Fox Machine Company, Grand Rapids, Mich. Circular. Describes the Fox adjustable saw dado or grooving head for cutting grooves in wood. It operates on the principle of a buzz saw, having the ability to cut an extra wide kerf. The side walls are cut down by perpendicular cut off saws and inclined saws remove the center. The work is done with great rapidity and is left with a smooth finish. Heads are made in various sizes, adjustable or non-adjustable. Price-list of regular styles are given. Some mention is also made of the Fox new sectional groover head, the gang dado machine and miter machines.

Power Pumps.—Goulds Mfg. Company, Seneca Falls, N. Y. Catalogue. Size, 7 x 8 inches; pages, 192. Contains a short description of the plant and some details concerning the efficiency and general mechanism of Goulds pumps and comparative cost of pumping with steam engine, gas or gasoline engine or electric motor drive, followed by illustrations and specifications, with dimension tables of single acting triplex plunger pumps in a variety of sizes for pumping against various pressures. Similar treatment is given to double acting triplex piston pumps, double acting triplex plunger mine pumps, an electric mine sinking pump, single acting triplex pressure pumps, triplex power and ammonia piston pump, triplex stuff pumps, vacuum pumps, deep well pumps, working heads, &c. A succeeding section deals with rotary pumps and centrifugal pumps of various patterns. The latter part illustrates the various forms of drives for power pumps. Many interspersed leaves show typical installations.

Milling Cutters.—Union Twist Drill Company, Athol, Mass. Small catalogue of standard and special cutters for all kinds of gear teeth, keyways and worms, milling cutters for plain or formed work, metal splitting saws, cutters for spiral mills, angular cutters, concave and convex cutters, end mills, &c.

Magneto Signaling Apparatus.—Holtzer-Cabot Electric Company, Boston (Brookline), Mass. Bulletin 200. Covers apparatus necessary for telephone signaling or other signaling involving the use of magneto generators.

Turret Lathes.—Jones & Lamson Machine Company, Springfield, Vt. Booklet. Size, 4 x 6 inches; 244 pages; flexible leather binding, gilt edges. Title, "Evolution of the Machine Shop," by James Hartness. This book is now in its second edition and contains about 20 pages of new matter in the front dealing with machine shop management, organization, equipment, how to maintain efficiency, cost of production, &c. The subject as a whole is treated under three headings: First, relating to problems of management; the second, interests of the individual workers, and the third, some of the changes which are taking place in equipment. The remainder of the book is devoted to the Hartness flat turret lathe as made by the Jones & Lamson Machine Company, giving a very exhaustive description of its construction, illustrated with numerous line diagrams showing setting of the tools for special operations. The latter part contains details of tools, and all through there is much of instructive value.

Oil Purifiers.—Patterson, Gottfried & Hunter, Limited, 146 Centre street, New York City. Circular. Illustrates and describes the McClelland improved oil purifier, showing the construction and operation by means of a sectional drawing. It compares oil purifiers with oil filters and gives the advantages of the purifier and a number of testimonial letters.

Boring Machines.—Binsse Machine Company, Newark, N. J. Catalogue No. 3. Size, 5 x 8 inches; pages, 40. Confined to the Binsse horizontal boring machines. The tools are made in three sizes, graded according to the bar diameters. Each size is made in three or more lengths to accommodate various sizes of work. Illustrations show the three standard classes and details of machine parts. Considerable space is given to the tools which may be used in the machine and to special attachments and drilling jigs. Illustrations show the setting of the machine for performing peculiar operations.

Pipe Joint Flanges.—Crane Company, Chicago, Ill. Advance circular, 6 CLJ. Descriptive of Cranelap extra heavy flange pipe joints with flanges made from cast iron, ferrosteel, malleable iron, cast steel or welded steel, suitable for working pressures up to 250 pounds. The ends of the pipes are flanged out and are lathe finished ready for grinding to a ground joint and are held firmly together by bolt flanges. The flanges are made in long hub, short hub and ring types. Price-lists and tables of dimensions are given of the several styles of flanges.

Power Transmission Appliances.—Patterson, Gottfried & Hunter, Limited, 146 Centre street, New York City. Catalogue, 5 x 8 inches; pages, 250. This catalogue covers a wide range of supplies, such as couplings, hangers, pulleys (iron and wood), bearings, belting, gears, chains, shafting, countershaftings, rope sheaves, collars, &c.

Traveling Hoists and Trolleys.—Niles-Bement-Pond Company, 111 Broadway, New York City. Catalogue. Size, 9 x 12 inches; pages, 24. Exclusively concerned with Niles electric traveling hoists and trolleys, designed for service where the installation of an ordinary type of crane is too expensive. The electric traveling trolleys are made in from 2 to 10 ton capacities. A number of photographs are reproduced showing the traveling trolleys in actual service. The remainder of the book is descriptive of the electric traveling hoists, which are made in capacities from ¾ to 6 tons. Several different styles are illustrated.

Acetylene Generators.—U. S. Acetylene Company, 1220 Filbert street, Philadelphia, Pa. Catalogue. Deals with the Sunlight by Night acetylene generator, its operation and advantages. It is one in which the gas is generated by adding the carbide to water and not by dropping the water into the carbide. The advantages of acetylene, its cost and safety, are indicated.

Milling Machines.—Garvin Machine Company, Spring and Varick streets, New York City. Folder. Shows views of newly designed universal and plain milling machines with direct constant feed. The machines have greatly increased driving power and are made for high duty and high speed.

Coal Cutters.—Ingersoll-Sergeant Drill Company, 11 Broadway, New York City. Pamphlet, form 353. Describes the Radialax coal cutter. This is an improvement on the old puncher or pick machines and is used for shearing by swinging the tool in vertical or horizontal arcs. The machine is described at some length. Numerous views show different settings of the machines.

Slotters.—T. C. Dill Machine Company, Somerset, Mascher and Mutter streets, Philadelphia, Pa. Catalogue. Size, 6 x 9 inches; pages, 20. Goes into a very extensive description of the Dill slotting machines, giving more in detail concerning the construction and operation than any of the company's previous literature on the same subject. The machines are made in sizes having maximum strokes of 10½ to 25 inches.

Electrical Apparatus.—Fort Wayne Electric Works, Fort Wayne, Ind. Three bulletins. No. 1067 shows construction and use of type A transformers; No. 1068 contains a detailed description of a new line of induction motors, known as type M; wiring diagrams are given for various connecting arrangements. No. 1070 has to do with a series alternating current arc lighting system and deals at some length with parts which enter into it, including lamps, transformers, switchboards, regulators and lighting arresters.

Air Compressors.—Laidlaw-Dunn-Gordon Company, 114 Liberty street, New York. Bulletin L 508. Size, 6 x 9 inches; pages, 32. Contains a full description of the improved Cincinnati air compressor. This compressor has an air valve mechanism which permits all sizes to be directly connected without gears or belts to electric motors and gas engines. The bulletin shows adaptations of this compressor to different methods of driving and to different types of steam ends. The Cincinnati gear is applied to machines for all pressures, including those for 1000 pounds per square inch for liquefying carbonic acid gas and for charging compressed air locomotives.

Motors and Transformers.—Wagner Electric Company, St. Louis, Mo. Pamphlet and bulletins. The first contains a reprint of an article by G. Percy Cole, read before the Ohio Electric Lighting Association, on "Recent Developments in Single Phase Alternating Current Motors." Bulletin No. 72 has reference to standard lighting and motor transformers. Bulletin No. 73 shows a combined voltmeter and frequency indicator.

Electric Welding.—Standard Welding Company, Cleveland, Ohio. Hanger. One of the cards in a series giving useful information. They are intended to be put in a conspicuous place where they may be readily referred to. This card contains the decimal equivalents for all fractions of an inch in 64ths. A partial list is also given of a few of the articles which this company welds.

"Air Power," the quarterly publication of the Rand Drill Company, 11 Broadway, New York, has just completed its first year, and the many friends which it has made will regret to hear that for business reasons its publication is to be discontinued. Like its predecessors, the October issue is replete with interesting material and is very attractively illustrated. Among the leading articles are two of more than ordinary interest: one on the applications of compressed air in railroad work, and another a description of the Center Star mine, located at Rossland, in British Columbia. There is also the usual quota of information useful to those concerned with the designing and installation of compressed air apparatus.

H. S. Vrooman, Chicago, has issued a four-page leaflet on his foundry riddles. Two kinds are shown and briefly described, the flat bottom and the corrugated bottom. A list of prices is also given.

What is said to be the largest wind engine in this country is a great Dutch wind mill recently erected on the Ocean Boulevard, San Francisco. The concrete subbase is 42 feet in diameter and 30 feet high, with walls tapering in thickness from 48 inches to 30, and rests upon a concrete foundation 50 feet in diameter and 54 inches deep. The four great arms have each a radius of 51 feet and a wind area of 400 square feet, making 1600 in all. The main shaft, which is 13 inches in diameter and 18 feet long, is elevated 12 degrees above the horizontal on the score of efficiency. The big 24-foot turret which carries the fan and main shaft is revolved by means of an auxiliary steering wheel 12 feet in diameter, which keeps the big wheel always facing the wind. The lowest wind velocity at which the mill will operate is eight miles per hour, at which 5 horsepower is developed; at twenty miles 200 horse-power is obtained. The tips of the long arms always travel more than twice as fast as the wind.

The New York Central & Hudson River Railroad Company placed orders October 26 with several manufacturing companies for a total of 25,000 freight cars, calling for the expenditure of about $25,000,000. This order exceeds that recently placed by the Pennsylvania Railroad Company, which until then was the largest order for equipment ever placed by a railroad in this country. The New York Central orders are for delivery all through the year 1906. The cars will be manufactured as follows: Pullman Company, 10,000; Haskell & Barker, 7500; the Pressed Steel Car Company, 3000; the Western Steel Car & Foundry Company, 2000, and the American Car & Foundry Company, 2500. The order placed with the last-named company is in addition to other orders recently placed with it by the New York Central.

In an official test at Harrisburg, Pa., with a new vertical triple expansion high duty Barr pumping engine it was found that the fuel cost for pumping 1,000,000 gallons against a head of 246 feet was $1.42, which figures out at 0.69 mill per 1,000,000 foot-pounds of work delivered. This is on a basis, verified by the test, of 1.98 pounds of coal per indicated horse-power per hour, and coal at $1.50 per ton, delivered in the boiler room. This fuel was of a low grade, containing 17.5 per cent. of refuse and ash. The pump has a capacity of 12,000,000 gallons per 24 hours, and is furnished with steam at a pressure of 140 pounds per square inch by three horizontal return tubular boilers with Wilkinson stokers.

In October the open hearth plant of the Clairton works of the Carnegie Steel Company turned out about 49,000 gross tons of steel ingots. The best previous month's record at this plant was 42,500 tons. The Clairton works contains 12 50-ton furnaces, so that the new record can be considered an extraordinary one. The three blast furnaces at Clairton turned out in October about 41,000 tons of pig iron.

HARDWARE

THE trolley service in every part of the country is assuming such proportions and is becoming so efficient that in a great many communities it is having an important effect upon business. It is certainly giving merchants a good deal to think about, and unless they are alert and quick to act in the presence of changing conditions and new opportunities they will find that they are failing to keep up with the times. While the principal and original purpose of the trolleys is the carrying of passengers they are more and more aiding in the carrying of merchandise, and the express business, which is thus connected with their operation, has a direct relation to the sale and distribution of goods. There is little doubt that such service will increase almost indefinitely, and that merchants will thus be given facilities for attending to customers at much greater distances and in larger numbers than it was possible for them to serve a few years ago. When the influence also of the telephone is considered it is obvious that the merchants even in the smaller towns have a constantly enlarging field for enterprise.

Hardware manufacturers are only too familiar with the practice of jobbing houses in soliciting payment for representation in their catalogues. With the multiplication of jobbing houses and the great increase in the issuing of catalogues, which are more and more coming to be imposing volumes, the tribute thus levied became so burdensome that the American Hardware Manufacturers' Association several years ago took up the matter among the first reforms in trade practices to which their attention was given. The result of their activity and the strong position they took as to the unreasonableness of the practice tended greatly to diminish its prevalence. The general justice of their contention that the printing of the jobbers' catalogue was a part of the expense of distribution, which should be borne by the distributors rather than by the producers, was generally conceded, but owing to the difficulty which attends the refusing of the request of a good customer many manufacturers have found that their demands called for considerable sums which had to be charged up against selling expenses. While the evil has been diminished it has not been done away with.

Recognizing the good work which has been done by the Manufacturers' Association in this matter the course to be pursued by each manufacturer is to be determined by himself in view of his position and methods, the relations which he sustains to the trade and the special circumstances of each case as it presents itself. Some manufacturers have found it necessary or at least conducive to comfort and good feeling to make an inflexible rule against paying for such representation in their customer's catalogue. In many instances where a manufacturer's whole line is thus represented and not simply a selection from it, as is usually the case, there is more reason for payment of part of the cost than if only a few isolated articles are handled by the jobber and shown in his catalogue. Other manufacturers look at the matter in the light of the amount of business done with the jobber and calculate a certain percentage of their sales to such jobber as the basis of what they are willing to pay for such catalogue representation. Not a few try to get rid of the disagreeable and unbusinesslike proposition by contributing a nominal sum. The point to be emphasized is that the cost of printing catalogues belongs to the merchants and is part of the expense of conducting their business, and that it is for the manufacturer to determine freely what his course will be in regard to such gratuities.

Condition of Trade.

The continued strength of the Iron market is a dominant factor in the present situation and the effect of the advanced prices in the raw material is felt in the Hardware field. Heavy goods are beginning to respond to the influence, as in several lines higher prices are gradually being announced. A general tone of confidence is produced by this state of things, as Iron is regarded as a good index of trade conditions and tendencies. The demand upon the manufacturers in nearly all lines is steady and large, and in Builders' Hardware and supplies and Tools generally connected with building operations there is a very large volume of business, and some complaints are made of difficulty in obtaining goods, as factories are not able to respond as promptly as their customers would desire. Insufficiency of transportation facilities is shown in several ways, as manufacturers are delayed in receipt of material and their customers in the receipt of goods held back from shipment or too long in transit. The same influence also affects the agricultural classes as grain is held back from the market. A good many revisions of prices are being made, and several advances will be noticed in the following columns. Manufacturers, however, are generally conservative in making advances and the general run of Hardware is held steadily at former quotations. The trade find in these busy months full occupation for all their energies, and as a general thing all classes have reason to be satisfied with the condition of things which prevails.

Chicago.

Western Hardware jobbers and retailers report a continued heavy demand for all kinds of seasonable Hardware, and the filling in orders are more numerous than they have been, on account of the spell of cold weather prevailing throughout the West. The Stove trade has been the heaviest in years and manufacturers continue behind on deliveries. Notwithstanding the heavy demand for Stove Boards prices continue to rule exceedingly low, with small profits either to the manufacturer or the jobber. In the Stove trade demand is not entirely limited to heaters, such as generally prevails at this season of the year, and Ranges and Cooks are moving at an unprecedented rate for the fall season. The advance in Poultry Netting which was made last week was not unexpected by the trade, and while prices on Wire Cloth have not yet been announced it is believed they will be on a basis somewhat higher than those of last year. Sledges and heavy Hammers will also shortly be advanced and jobbers report heavy sales in keeping with the general prosperity of the Hardware trade. Notwithstanding the low prices that are prevailing on Tin Plate jobbers report demand very light; small dealers and consumers are buying for their immediate requirements only, not being tempted by the low prices recently announced. Sales of Paint continue good and the business done in this line in the past few months, while smaller than that done in the spring, has been extremely

satisfactory. There seems to be no abatement in the demand for Wagon and Implement Hardware and manufacturers are unable to make satisfactory deliveries. Wood Stock also continues scarce and is higher in price. The advance announced in Manila Rope was not wholly unexpected by the trade in view of the higher prices that will have to be paid for Hemp. Sales of husking goods this fall establish a new record in the trade, due entirely to the tremendous corn crop. Manufacturers of Husking Gloves, Corn Knives and Hooks continue to receive filling in orders, which is unusually late in the season. Trade during the month of October has been extremely satisfactory and slightly in excess of September.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—Our city jobbers appear to be actively engaged with their business and trade continues with the activity expected at this writing. Retail merchants, as a rule, are somewhat delaying ordering winter goods, or goods for winter trade, giving as their reason that they are engaged in their daily business and do not want to have charges made to them in advance of their wants, our weather being very mild as a rule and considerable of it almost like summer. The trade are accustomed to having salesmen call upon them so frequently that they feel they can delay buying a few weeks without inconvenience.

Jobbers are thus required to carry a full stock of goods in anticipation of wants, and when manufacturers are behind their orders both jobbers and retail merchants must suffer; indeed, we might have added that manufacturers must correspondingly suffer. We find that many of the retail merchants are waiting to hear about matters that may present themselves at the meetings of the National Hardware Association and the American Hardware Manufacturers' Association to be held at Washington November 8, 9 and 10.

Notwithstanding all the conditions referred to trade continues in a very satisfactory condition. Collections are fair.

Cleveland.

THE W. BINGHAM COMPANY.—A decided increase is shown in the sales of all lines of goods over last year at this time. The large crops are giving our customers plenty of money, and they are spending it quite liberally. The trade generally is fine, especially so in Builders' Hardware. The demand for this line is greater than ever before, and the trade seems to be buying a better class of house trimmings than formerly. Our sales on the general line of Shelf Hardware are extensive, and we expect to complete this year's business with a large amount of merchandise to the credit of our selling department.

We anticipate some changes in prices about the first of the year on some staple goods and we believe it is to the interest of customers to supply their wants now while they can buy these goods to advantage. We have reference to Steel Goods, Shovels, Spades, Strap Hinges, Butts, Barn Door Hangers and Rail, &c. Now that the prices have been made on Wire Cloth and Poultry Netting it would be well for the trade to place their orders for spring shipment early, that they may be served promptly. The price of Fence Wire and standard Wire Nails since the last advance seems to be maintained. Large quantities of these commodities are going forward by rail and water. Trade and traffic in general are quite satisfactory, though prices for the most part are too low on many goods, but we anticipate a change for the better.

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—Business continues on the even tenor of its way. Poultry Netting advances, Wire Cloth declines. One line of goods belongs to one family of manufacturers, the other line to another. One seems to be a happy family, the other—well, it's different!

The scramble for future shipment orders will now commence. The popular salesman and the best liked house, as usual, will get most of the business. The salesman who is not "next" will write his house that his lack of success is on account of his price, while the salesman who has his trade solid will sell the goods probably without making any price at all, but simply upon his personal assurance that he will take care of them.

After all, what a lot of sentiment there is in business! How we do like to buy from our friends, and how little show the other fellow stands! It is often interesting to note how friendship, environment and some of the simplest principles of human nature sway men and things! How local prejudices, small personal interests and sentiment color the judgment of men in considering some of the broadest business questions!

The man who long ago foretold the effect of sea power upon the history of the world speaks too long and is clapped down at a banquet even in serious Boston, while some unknown, who knows how to adorn a tale, is the hero of the hour. One often wonders whether the mass of the people actually care for facts. An oratorical appeal to local pride, a dash of sentiment, a touch upon the pedal of personal jealousy, and where are your carefully compiled statistics of facts?

Recently, at the front door of a Hardware store, the writer heard a salesman holding forth with great emphasis upon a certain question which for some time past has been agitating the Hardware trade. The writer was an interested listener. This traveling orator had everything coming his way. His eyes flashed, his hands clenched, his voice rolled and thundered. Finally one of the men in the group asked him to answer a few questions on this subject. This traveling molder of Hardware opinion did not know the simplest facts in connection with the case. He had not studied the catalogue he was talking about. He did not know the prices that were quoted. He was strong on glittering generalities, but he was decidedly short on facts. Still he made his impression.

The writer has read a good many anonymous articles in the trade press on the catalogue house question that were a good deal of the same character as the talk of this orator. We have wondered how much some of these critics have studied the actual facts in regard to this question, how many hours they have spent studying these catalogues and comparing prices, how much they realize the unequal battle that is being waged against the small retail dealer.

Baltimore.

CARLIN & FULTON.—From all reports October has been a busy month in every section and in every line. Locally the buyers visiting our city during the last few weeks have been from the adjacent territory, the more distant trade always being early in the market. It has always been our experience that during the month of November the retail dealers prefer to devote their time to pushing the sales of goods bought early in the fall and it seldom pays to travel with the expectation of large orders, as any purchases for immediate shipment are mostly of a filling in character.

The market has been remarkably firm and advances have been announced in a number of lines. The necessity of the manufacturers to look ahead for business, the consolidation and specialization of manufacturing, seem to have changed very greatly the methods of business and one always lives about a year ahead. Before the wheat is threshed or the corn is cut or the frost has touched the grass the manufacturer is after his order for the probable needs of the next year in Scythes, Corn Hooks and Lawn Mowers, and the list could be extended very largely. At one time it was the manufacturer who carried the stock in anticipation of a future season's demands. Today the policy seems to be to shift the burden to the jobber, and it has almost become a necessity to do this and escape the delay and inconvenience attached to the congestion of orders and delays of transportation.

Within the last few days we have been advised of advances in Poultry Netting, to which few would object provided the stocks on hand were large; but this advance has occurred at the end of the season, with no orders booked by the manufacturers at old prices for future

delivery, so that the association has shown great shrewdness in its action. Sledge Hammers have also advanced, as might well have been expected after the extreme low figures of the year. There are perhaps other goods which are in the same category and which will follow suit in case the demand should increase.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—Trade conditions as reflected in the reports all over the country are excellent. Occasionally we hear of weak spots here and there, as is only natural in this wide area and with such diversified production as our country affords. We cannot keep Stove Bolts screwed up to the tension proportionate to other similar products. It is only because the man behind the machine has laid down his Wrench for something more important. Stove Bolts will come in for their share in the right time. In the meanwhile various uses are developed for them which heretofore have been neglected or unobserved. This adaptness of any article is not without its good fruit. It brings it to the front prominently as a possibility in a great variety of ways, and so oftentimes the substitute turns out to be better than the original thing itself. The old episode of the Foot Warmers that were shipped by mistake to Cuba and sold there for Broilers comes to mind as a stroke of genius in disposing of wares made for one purpose but adaptable for one entirely different.

In the heavier construction material prompt deliveries are out of the question. We are pushing for Angles and Architectural Shapes. Some of these were ordered last July, and the best promise we can get is about 60 days hence. This will give an idea of the demand for that sort of material at present. If the large buildings projected in our city are an index to what is going on all over the country it is no wonder. We have never had such an era of building, not only here but in all of the Southern States. Good prices contribute to good humor. The triumphal procession of President Roosevelt through the South would not have been possible on 5-cent cotton.

Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—The Lewis and Clark Exposition is now a matter of history, and it compares well with expositions that have preceded it, both in matter of admissions and dividends that will likely be returned to stockholders. Comparing our 2,500,000 admissions as against St. Louis' 14,000,000, considering population tributary to both and amounts expended in enterprises, we show up well. The benefits accruing to the city indirectly in improvements of streets, sidewalks and buildings for the past three years preparing for the exposition are hard to estimate.

There is no reaction at this time in sight. Inside business property is selling at prices never touched in the history of the city. Building operations both in hand and contemplated are on a scale far ahead of any time in the past.

Crops in all sections of Oregon and Washington have not turned out so well as at one time promised, nor are prices so good as last year, still with proceeds of the last and former crops producers are in good shape to buy what they want. Trade in all lines is coming in in good strong volume and should hold up well into the holidays.

Omaha.

LEE-GLASS-ANDREESEN HARDWARE COMPANY.—The volume of business for October in the Trans-Missouri region is a record breaker. The prevalence of satisfactory and promising conditions is an assurance of continued activity. The corn crop in Nebraska is closely estimated at 245,000,000 bushels, which should bring into circulation about $95,000,000. To this may be added the wheat and other small grain crops, which were very heavy. The agricultural producers therefore are all in a highly prosperous condition, as the prices obtained for these enormous crops represent a substantial margin of profit. The farmers of the Trans-Missouri country were never as a whole more prosperous than they are at this time, never were freer from debt and never before had so much capital at their command.

The strength of the iron market, and the heavy pressure upon the mills and furnaces are features of marked importance. Heavy and staple goods are naturally responding to the impulse and rising gradually to a higher level of values. These conditions tend to produce a spirit of general confidence in the future and act as a stimulant to industry and enterprise. There is every reason to expect that the contribution which the Trans-Missouri country will make the present year to the national wealth and prosperity will surpass the best previous record.

St. Paul.

FARWELL, OZMUN, KIRK & CO.—There has been very little to disturb the even current of trade for some time. The weather has been favorable for farm work, which has retarded trade to some extent, and the great scarcity of cars for moving the grain to market has also affected both trade and collections. Still, the orders have been coming in quite satisfactorily and the general tone of business is good.

Prices have been running along steady and retail merchants have not been buying on speculation on the one hand, and on the other hand they have not been afraid to buy for wants. The demand for Stoves and Furnaces has been strong, and the indications are for colder weather this fall than has been experienced these later years.

Collections have been fair, but have been held back by the shortage of cars, previously mentioned, which is very serious on some lines of road, especially in the newer sections of the country.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—The Hardware jobbers of this city are enjoying a nice business; orders are plentiful and of good size and cover a complete assortment of goods. There is a heavy demand for seasonable lines and a scarcity of such articles as Stoves, Stove Boards, Stove Pipe, Coal Hods, Toy Wagons, Leather and Harness Goods, Loaded Shells and Ammunition. Collections are also coming in in a satisfactory manner.

NOTES ON PRICES.

Wire Nails.—Orders for a heavy tonnage were placed with the mills during October. Buyers are urging prompt deliveries in view of the probable increase in car shortage and consequent delays incident to storms and bad weather. The market is firm. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads to jobbers	$1.80
Carload lots to retail merchants	1.85

New York.—There is no abatement in the demand and jobbers have difficulty in keeping stocks assorted to the requirements of the trade. Jobbers bought large stocks before the recent advances and keen competition results in irregularity of prices. Regular quotations for small lots from store are, however, $2 to $2.05, base.

Chicago.—Rumors of an early advance have been widely circulated throughout the West and South and as a result large orders have been placed by jobbing and consuming interests supplementary to the heavy tonnages placed preceding the recent advance. Reports of an early advance are evidently without foundation, as the heavy buying for the remainder of this year was done some time ago. October tonnage is greatly in excess of that taken during the same month last year and almost equals September's total. Prices continue to be well maintained and mills are pushed for shipments, jobbers and consumers specifying heavily in anticipation of a car shortage and bad transportation facilities a little later in the year. Official quotations are as follows: $1.95 in car lots to jobbers and $2 in car lots to retailers, with an advance of 5 cents for less than car lots from mill.

Pittsburgh, by Telegraph.—We note a continued active

demand for Wire Nails, a good deal of new business being placed, while the large trade is specifying very liberally on contracts placed before the two recent advances in prices. In view of the continued scarcity of Steel and the higher prices ruling for it, together with shortage of cars and heavy orders on the books of the mills, an advance in prices of Wire Nails during November is anticipated to some extent. Prices continue very firm and the general condition of the Wire Nail market is very satisfactory. We quote Wire Nails at $1.80 in carloads to the largest jobbing trade and $1.85 in carloads to retail merchants, f.o.b. Pittsburgh, plus actual freight to point of delivery, terms 60 days, less 2 per cent. off for cash in 10 days.

Cut Nails.—At the meeting of the Cut Nail Association held last week some of the manufacturers expressed a disinclination to sell their product at less than $1.70, base. This expression was based upon the advanced cost of raw material and the good demand which exists. Even without official action in reaffirming or changing the price the position taken by the association manufacturers will have a strengthening effect upon the market. Quotations are as follows: $1.65, base, for carload lots, f.o.b. Pittsburgh. Iron Cut Nails for delivery at Pittsburgh, Buffalo and all points west of these cities are held at $1.75, base, in carload lots.

New York.—Demand is good and difficulty is experienced in getting Nails promptly enough for jobbers to keep stock assorted. No change has been made in store price for small lots as the result of the views expressed at the meeting of the Cut Nail Association last week. Prices are irregular owing to competition. Regular quotations for small lots from store are, however, on the basis of $1.90.

Chicago, by Telegraph.—A strong tone prevails in the Chicago market for Cut Nails and manufacturers are taking orders for immediate shipment only, which would seem to justify an advance in the near future. Car interests have bought heavily and the railroads are now coming into the market with large requirements. Quotations are as follows: $1.85, base, for carloads, Chicago. Iron Cut Nails are held at an advance of from $1 to $2 a ton.

Pittsburgh, by Telegraph.—Buyers continue to place liberal orders for Cut Nails in view of the expected advance in prices. It is claimed that the high prices of Steel fully warrant an advance in Cut Nails, which are relatively low. We quote Cut Nails $1.65, base, in carload lots, f.o.b. Pittsburgh, an advance of 10 cents per keg being charged for Iron Cut Nails.

Barb Wire.—Specifications are being received by mills for shipment of liberal quantities, while current demand continues fair. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots	$1.95	$2.25
Retailers, carload lots	2.00	2.30
Retailers, less than carload lots	2.10	2.40

Chicago.—Demand for Barb Wire continues fair and liberal. Specifications are being received for Wire and Staples on contracts taken some time ago. Prices continue firm and unchanged. Quotations are as follows: To jobbers, Chicago, car lots, Painted, $2.10; Galvanized, $2.40; to retailers, car lots, $2.15; Galvanized, $2.45; retailers, less than car lots, Painted, $2.25; Galvanized, $2.55; Staples, Bright, in car lots to jobbers, $2.05; Galvanized, $2.35; car lots to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh, by Telegraph.—Current orders and specifications on old contracts are being received by the mills in large volume, and shipments of output are being made by the mills practically as fast as cars can be obtained, which are scarce, the supply of Steel being also limited. The Wire trade is more active than usual at this season of the year, prices being firm and well maintained. We quote Painted Barb Wire at $1.95 and Galvanized at $2.25 in carload lots to the large jobbing trade, with the usual advance of $1 a ton to retailers in carload lots, f.o.b. Pittsburgh, 60 days, or 2 per cent. off for cash in 10 days.

Smooth Fence Wire.—Specifications on contract orders being received by the mills are in excess of shipments. It is understood that orders booked are equal to the capacity of the mills for the remainder of the year. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.65
Retailers, carloads	1.70

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12&12½	13	14	15	16
Annealed	Base	$0.05	.10	.15	.25	.35	.45	.55
Galvanized	$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago.—The leading interest has orders booked to the limit of its capacity for delivery the remainder of the year. Specifications on contracts placed some time ago are being freely received and greatly exceed mill shipments. Prices are being well maintained and are unchanged, as follows: $1.80 to jobbers, f.o.b. Chicago, in car lots, and to retailers, car lots, $1.85.

Pittsburgh, by Telegraph.—The leading mills have their output pretty well sold up to the end of the year on current orders and on specifications which are coming in very freely. Tonnage in Fence Wire shipped out by the mills in October was a record breaker, but will hardly be as heavy this month. Cars are scarce and the mills are having trouble in getting steel as fast as needed. Official prices are firm and are being well maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.65
Retailers, carloads	1.70

The above prices are for base numbers, 6 to 9.

Bolts, Stove and Tire.—The expected disruption of the Stove and Tire Bolt Association, which adjourned *sine die* on October 26, could have no marked effect upon the market. As an indication of the demoralization already prevailing it may be stated that Stove Bolts have been selling at a base discount of 90 per cent. Some producers are refusing to meet the extreme quotations and are reducing their output of these goods, preferring to use their material and energy on more profitable lines. Others, however, are making prices which their competitors regard as below cost and venture to conjecture that the present state of things cannot long continue.

Screen Wire Cloth.—The manufacturers of Screen Wire Cloth have announced prices for next season, and the trade will be surprised to learn that a reduction has been made in the price of the regular painted 12-mesh Cloth, which is now quoted at 10 cents less than last year. Cloth of finer mesh is quoted at substantially the same prices as last season. This is a line to which jobbers are giving a good deal of attention, and their salesmen are already in some cases booking orders from the more enterprising retail merchants who purchase some time in advance.

Poultry Netting Staples.—Manufacturers of Poultry Staples have agreed upon a price below which they are not to sell, the extras applying to such base price being the same as those which have been in force during the past year. There is not, however, entire agreement among the manufacturers in regard to the quotations which they are making on these goods, as some of them are keeping a little farther away from the lowest price permitted than are others.

Wire Cloth, Hardware Grades.—The result of the conferences between the manufacturers has been an agreement to maintain the same prices on the Hardware grades of Wire Cloth as have prevailed during the past year. This decision was reached notwithstanding the somewhat higher prices which are ruling for the raw material.

Wedges, &c.—An advance of about 20 cents per hundred pounds has been made in the price of Wedges and some similar goods. A quotation of 2½ to 2¾ cents will thus represent the market for Wedges in ordinary lots.

Heavy Hammers.—The demoralization in Heavy Hammers and Sledges which has characterized the market for some time has apparently been terminated, as manufacturers unite in announcing materially higher quotations. In a general way the market is represented by the discount of 80 and 10 and 10 to 80 and 10 and 10 and 10 per cent. on the Heavy Hammers and of 80 and 10 to 80 and 10 and 10 per cent. on the Light Hammers, with an additional discount to the jobbing trade.

Spring Hinges.—The market on Spring Hinges, which for several weeks has been in a disturbed condition, has now assumed a more settled tone. As a result of conferences between the manufacturers some agreement has been reached in regard to prices and the market is no longer an open one. The prices determined upon are considerably lower than those for last year. In the present state of the market retail merchants buying in fair quantities will probably be able to purchase Holdback Hinges, Cast, at from $6.50 to $7 per gross, while the Holdback Hinges made of Sheet Steel may be obtained at about 25 cents per gross less. In a general way the Non-Holdback Hinges, Cast, may be quoted at $6.50 to $6.75 per gross. A good many orders have been placed by the larger merchants and at slightly lower prices than are now ruling, as at one time a concession on carload lots was made which has, we are advised, been withdrawn.

Poultry Netting.—The manufacturers of Poultry Netting agree in announcing somewhat higher prices than have been ruling. An active business is being done in this line, purchasers anticipating that the higher prices announced will be maintained. The market is represented by the quotation of discount 80 and 10 per cent. on the Netting galvanized before weaving and 80 and 5 on the Netting galvanized after weaving. The current prices are thus something like 7½ or 10 per cent. higher than were in force during the past season.

Sheet Metal Ware.—Prices on Stamped, Pieced, Japanned and Galvanized Ware, &c., are slightly lower as a result of the fact reported last week that the associated manufacturers have discontinued their efforts to regulate the market. The usual effects of an open market are not observed, however, for the reason that competition between concerns inside and outside the association has been keen for many months and some goods, especially in the galvanized line, have been sold very close. Thus there is a natural hesitation to begin cutting below the present level, especially in view of an advancing market for raw material. Demoralization is also effectually prevented for the time being by a continued volume of business, which is generally agreed to be exceptionally good. Nevertheless, the conditions are such that with any slackening of demand considerably lower prices may be expected. Some manufacturers are already taking steps to get away from a uniform method of quotation, and buyers may well be confused by the various lists and discounts, rebate scales and net prices in force.

Rope.—The market appears to be firm at the advanced prices recently announced by manufacturers. Demand continues good. Quotations are as follows: Pure Manila, 12½ cents; B quality, 11½ cents; Pure Sisal, 9½ cents; No. 2 quality Sisal, 8 cents per pound.

Linseed Oil.—The price of Oil has been reduced 3 cents per gallon since our report last week. October deliveries on contract orders have brought considerable Oil into the market. Prices for contract Oil during September ranged from 35 to 38 cents per gallon, and probably the majority of orders were placed at or near the lower figure. Deliveries on most of these contracts extend to the first of the year. Demand from consuming sources will naturally grow less as the season advances and the Seed market shows some weakness. New York quotations for prompt delivery are as follows: City Raw, 42 to 43 cents per gallon; State and Western Raw, 40 to 41 cents per gallon, according to quantity.

Spirits Turpentine.—Prices have advanced with a higher Southern market, which results from control by Southern operators. Local demand was of a hand to mouth character. New York quotations are as follows, according to quantity; Oil barrels, 69½ to 70 cents; machine made barrels, 70 to 70½ cents.

Window Glass.—Additions are gradually being made to the factories already operating and within two weeks it is expected that all factories not already working under the sliding scale of wages will be put in blast under the flat scale. Demand from factories is less than was expected it would be at this time, buyers not purchasing beyond their immediate requirements at the present high prices, which are reported to be about 90 to 90 and 2½ per cent. discount in car lots from factory, although some manufacturers, it is said, have made lower quotations. It is reported that the American Glass Company has made lower quotations on its machine made Glass since it was found that hand made factories were to be started on the flat scale. This competition may bring prices down to a lower level. New York quotations are as follows: First two brackets, single and double strength B, 90 and 10 per cent. discount; all other sizes, single and double strength, 90 per cent. discount.

Letters from the Trade.

Our readers are invited to discuss in these columns questions of trade interest connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.

Not 500 Per Cent. Profit.

In the letter of "Gunner" in *The Iron Age*, 12th ult., reference was made to present merchandising conditions as requiring smaller margins of profit, and an example was cited of a retailer's assortment of Spooled Wires consisting of 147 spools in a compartment box which may be bought by the merchant for about $2 and which is retailed at 5, 10 or 15 cents per spool, according to size and kind, the whole aggregating $11.10. In the following letter a Hardware merchant takes issue with the statement that there is a profit of 500 per cent. on the transaction:

To the Editor: It would show a 500 per cent. profit if the retailer sold it at once for $11.10. The probabilities are, however, that the retailer made 147 separate sales, each one taking from five to ten minutes' time, possibly some of them charged to the customer's account. Taking these points into consideration the retailer did not make 500 per cent., as his time or the time of his assistant is surely worth something in making a 5-cent sale.

RETAILER.

Sales to Consumers by Manufacturers and Jobbers.

To the Editor: Speaking from experience as a retail salesman, traveling salesman and finally Hardware merchant, as an interested reader of the trade journals, as a visitor to some extent to Hardware conventions, it is positively amusing to see the position of some manufacturers who are prominent members of the American Hardware Manufacturers' Association. Two of these concerns who sell to us are selling direct to consumers in our territory, selling goods on which we have been loyal and steady customers of theirs. Another concern, a jobbing house identified with the National Hardware Association, is in our territory selling direct to the consumer a line of goods which we have to buy from this house because it is the factory agent for territory which includes us. We had been the factory agent for a certain territory which, with other territory, was afterward given to the jobber, and we knew nothing of the deal until it was closed and the jobber was offering the goods to us and selling to consumers at the same time.

NEW ENGLAND.

The Hardware business of H. C. Wilson & Co., Meridian, Idaho, has been sold to J. A. Pfost.

When Season Goods Sell the Best.

IN our issue October 12 we published a letter from a prominent jobbing house, in which the desirability and need of a "table showing the exact period when special goods in the Hardware line are required for stock to meet season demands" were emphasized. The suggestion was made that perhaps the readers of *The Iron Age* might help in the preparation of such a table.

In reply to this inquiry we have a very interesting communication from A. M. Matthews & Co., an enterprising Hardware house at Orange, N. J., who submit an alphabetically arranged list of goods showing about the time of year they find the best sale for the lines designated. This list, which will doubtless be found suggestive and helpful as pointing out with some definiteness the part of the year when special goods are in large demand, and presumably should be in full stock, is as follows:

Axes, Hatchets, etc.:	October 1 to May 1.
Brooms, Brushes, etc.:	April 20 to June 1; September 15 to November 1.
Cans, Ash and Garbage:	October 1 to June 1
Carpet Sweepers:	October 1 to June 1.
Cartridges, Shells, etc.:	October 1 to December 1; June 1 to July 5.
Chair Seats:	October 1 to June 1.
Choppers, Meat or Food:	All the year
Coal Hods:	October 1 to June 1.
Coffee Mills:	October 1 to June 1.
Dog Collars, Chains, Muzzles:	All the year, Muzzles especially month of June.
Door Checks:	November 1 to June 1.
Electrical Goods:	October 1 to June 1.
Flower Pots, etc.:	September 15 to December 1; April 1 to June 1.
Garden Tools and Seeds:	March 1 to July 1: Small demand in fall also.
Glass:	October 1 to December 1; April 15 to July 1,
Harness and Stable Supplies:	All the year.
Hose:	May 1 to August 1.
Ice Cream Freezers and Ice Tools:	May 15 to July 5.
Incandescent Goods, Gas Fixtures, etc.:	Sept. 1 to May 1.
Jars and Canning Supplies:	June 1 to October 15.
Knives, Cutlery, etc.:	November 15 to January 1; April 15 to June 1.
Ladders, Step and Extension.	April 15 to October 15.
Lamps and Lanterns:	October 1 to May 1.
Lawn Mowers:	May 1 to July 15.
Loaded Shells:	October 1 to November 1.
Painters' Supplies:	Staple all the year around; September 1 to October 15 and April 1 to July 1 demand largest.
Skates and Skating Supplies:	November 15 to January 1.
Snow Shovels:	December 1 to March 15.
Traps:	All the year.
Tree Guards:	May 1 to October 1.
Twines, Rope, etc.:	All the year.
Upholstery Supplies:	April 15 to June 1; September 15 to November 1.
Watering Cans:	May 1 to October 1.
Weather Strips:	November 1 to January 1.
Wheelbarrows:	April 1 to June 1; October 1 to December 1.
Wire Cloth and Poultry Netting:	April 1 to October 1.

Remarking that it is impossible on many lines to set a definite day and that the kind of weather prevalent, for example, would make a great difference in certain lines, our correspondents make the following observations in regard to the time for making window displays and getting out advertising matter for the goods named:

LOADED SHELLS.—Begin window displays at intervals about October 1; sale continues to about December 1.

CUTLERY should be shown at intervals all through the year. The best selling periods are the week prior to Thanksgiving and the two weeks prior to Christmas. There is also apt to be a good selling season along about May 1. People are moving and find that articles are either worn or mislaid and desire to replace them. But the best season, especially on fine goods, is just before Christmas.

SKATES are so dependent on the weather that it is practically an impossibility to set any definite time to begin showing and advertising them. Occasionally we have had seasons when the middle of November was about right, and again we have had times when a month later was early. Our experience is that the earlier skating sets in the better the sale. Good skating in January and February never produces the results that good skating in December does. We always start our window shows of Skates as soon as ice begins to form at all on small ponds, as the average small boy will risk a cold bath any time for the glory of being the first skater of the season. After January 1 it is useless to show Skates. What you sell you will sell any way, and you cannot make trade by any amount of pushing.

ICE CREAM FREEZERS.—We generally begin to push about May 20 and drop after the Fourth of July, although of late years we note a tendency on the part of these goods to be more or less staple all the year around. This we take is due to the fact that when people who have been in the habit of using a Freezer wear one out they buy another without regard to the season.

HOUSE CLEANING Goods are always staple. Their best sales, however, are from April 20 to June 1, and again from about September 15 to November 1.

UPHOLSTERY SUPPLIES.—The fall season is the best on Curtain Rods, Chair Seats and other goods coming under this general head.

The whole subject is of general interest and we invite further suggestions from the trade at large. The lines of goods named above can doubtless be supplemented, and the experience of other merchants would be valuable to many who are on the lookout for approved methods in the conduct of the buying and selling departments of their business.

NEXT WEEK'S GREAT CONVENTIONS AT WASHINGTON.

ARRANGEMENTS are now practically completed for the annual conventions of the National Hardware Association and the American Hardware Manufacturers' Association at Washington on Wednesday, Thursday and Friday of next week. The headquarters of the jobbers will be at the Arlington and Shoreham hotels and of the manufacturers at the New Willard. The Normandie and the Ebbitt House will also accommodate some of the visitors to the conventions. It seems quite likely that the attendance of members of both associations will compare favorably with that of any of the great annual gatherings of the past, while the fair sex will also be in conspicuous evidence, thus contributing much to the success of the splendid programme of entertainment which has been arranged.

Chicago Special Train.

Following is a list of the gentlemen who will comprise the party leaving Chicago Sunday, November 5, at 11 a.m., on the special train arranged for by a committee of which W. H. Bennett of the Lawson Mfg. Company, Chicago, is chairman:

W. J. Gold, Chicago Hardware Company, Chicago, Ill.
E. A. Hoffman, Hoffman Hardware Company, Los Angeles, Cal.
G. W. Trout, Trout Hardware Company, Chicago, Ill.
C. D. Clark, Clark, Quien & Morse, Peoria, Ill.
Rudolph Tenk, Tenk Hardware Company, Quincy, Ill.
Chas. M. Hurst, Morehouse & Wells Company, Decatur, Ill.
Otto Boetticher, Boetticher, Kellogg & Co., Evansville, Ind.
L. C. Empkie, Empkie, Shugart, Hill Hardware Company, Council Bluffs, Iowa.

C. A. Knapp, Knapp & Spencer Hardware Company, Sioux City, Iowa.
H. B. Buhrmaster, Charles F. Schmidt Hardware Company, Burlington, Iowa.
T. E. Hurley Brown-Hurley Hardware Company, Des Moines, Iowa.
F. H. Luthe, Luthe Hardware Company, Des Moines, Iowa.
J. S. Hayes, Huber & Kalbach Company, Oskaloosa, Iowa.
P. E. Cutler, Cutler Hardware Company, Waterloo, Iowa.
J. G. Bauer, W. A. L. Thompson Hardware Company, Topeka, Kan.
I. N. Hockaday, Hockaday Hardware Company, Wichita, Kan.
W. H. Harwi, A. J. Harwi Hardware Company, Atchison, Kan.
J. B Silliman, Blish, Mize & Silliman Hardware Company, Atchison, Kan.
J. C. Fritchie, Lee Hardware Company, Salina, Kan.
Arthur Brittan, manufacturers' agent, Chicago, Ill.
Ed. Dunning, Sargent & Co., Chicago, Ill.
C. C. Philbrick, Foster, Stevens & Co., Grand Rapids, Mich.
Geo. W. Wells, Kelley-How-Thomson Hardware Company, Duluth, Minn.
T. G. Walther, Hackett-Walther-Gates Hardware Company, St. Paul, Minn.
E. M. Andreesen and H. J. Lee, Lee-Glass-Andreesen Hardware Company, Omaha, Neb.
John C. Koch, John Pritzlaff Hardware Company, Milwaukee, Wis.
J. C. Kroner, Fred Kroner Hardware Company, La Crosse, Wis.
D. A. Merriman and A. B. Wayne, American Steel & Wire Company, Chicago, Ill.
W. H. Eaton, American Sheet & Tin Plate Company, Chicago.
N. A. Gladding and W. L. Sanford, E. C. Atkins & Co., Indianapolis, Ind.
Ed. Beall, Beall Brothers, Alton, Ill.
R. B. Jones, Clyde Cutlery Company, Clyde, Ohio.
Fred. W. Fee, Corbin Screw Corporation, Chicago, Ill.
D. O. Macquarrie, Corbin Cabinet Lock Company, Chicago, Ill.
Chas. T. Johnson and R. F. Lind, Dover Mfg. Company, Canal Dover, Ohio.
F. D. Ford, Eagle Lock Company, Chicago, Ill.
Ludlow S Sherwood, Columbian Hardware Company, Cleveland.
W. H. Bennett, Lawson Mfg. Company, Chicago, Ill.
W. D. Hodson, National Sweeper Company, Marion, Ind.
T. J. Usher, Russell & Erwin Mfg. Company, Chicago, Ill.
M. L. Corey, secretary National Retail Hardware Association, Argos, Ind.
S. R. Miles, member Executive Committee National Retail Hardware Association, Mason City, Iowa.
W. G. Miller, Ohio Tool Company, Chicago, Ill.
Frederick Pease, Charles Parker Company, Meriden, Conn.
Theodore Huss, Lufkin Rule Company, Saginaw, Mich.
H. G. Reynolds, Reynolds Wire Company, Dixon, Ill.
W. B. Merriman, Reynolds Wire Company, Dixon, Ill.
Daniel Stern and W. F. Wallace, the *American Artisan*, Chicago.
Walter W. Birge, Ames Shovel & Tool Company, St. Louis, Mo.
E. M. Kemp, Wabash Screen Door Company, Chicago, Ill.
J. D. Warren, J. D. Warren Mfg. Company, Chicago, Ill.
D. W. Simpson, Wilcox Mfg. Company, Aurora, Ill.
C. M. Avery, C. M. Avery & Co., Chicago, Ill.
John T. Rowntree, manufacturers' agent, San Francisco, Cal.
H. A. Taylor, American Screw Company, Chicago, Ill.
W. L. Harvey, Garland Nut & Rivet Company, Chicago, Ill.
Louis Kuehn, Milwaukee Corrugating Company, Milwaukee, Wis.
Frank M. Baldwin and J. E. Pilcher, Baldwin Forging & Tool Company, Columbus, Ohio.
George Overton, P. & F. Corbin, Chicago, Ill.
A. C. McKinnie, Stanley Works, St. Louis, Mo.
D. B. Woodbury, Stanley Works, Chicago, Ill.
Geo. T. Bailey, Oliver Iron & Steel Company, Pittsburgh, Pa.
C. F. Braffet, Simonds Mfg. Company, Chicago, Ill.
T. Frank Ireland, member Executive Committee National Retail Hardware Association, Belding, Mich.
M. G. Rodearmel, manufacturers' agent, Minneapolis, Minn.
W. C. Dickey, Ward-Dickey Steel Company, Indiana Harbor, Ind.
W. H. Klauer, Klauer Mfg. Company, Dubuque, Iowa.
Palmer W. Holmes, Lalance & Grosjean Mfg. Company, Chicago.
D. B. Gann, Gann & Peak, Chicago, Ill.
W. A. Campbell, Chicago, Ill.
Don McMillan, manufacturers' agent, Chicago, Ill.
F. B. Platt, Farwell, Ozmun, Kirk & Co., St. Paul, Minn.
S. R. Droescher, 58 Warren street, New York.

Quite a number of the men will be accompanied by their wives, and the trip to the capital city will doubtless be most enjoyable.

THE WILLIAM SCHOLLHORN COMPANY, New Haven, Conn., which recently announced its intention to build a new five-story addition to its factory, has since purchased another piece of land, upon which it will erect a one-story brick building. The two buildings will be erected during the coming winter and will be pressed into service for manufacturing purposes early next spring. They will double the company's output in Bernard's Patent Pliers, Nippers, Belt and Ticket Punches, Dividers, &c.

STANDARD SIZES FOR CATALOGUES.

AT the last meeting of the Southern Hardware Jobbers' Association a committee consisting of J. D. Moore, Charles H. Ireland and C. B. Carter was appointed to look into the matter of a standard size for regular bound and loose leaf catalogues. Under date of the 23d ult. the committee has rendered the following report:

After a very careful canvass of our membership, both as to the size of catalogues and loose leaf binders they are now using and their ideas and wishes as to something more desirable, if any, we recommend the adoption of the following size sheet for the regular printed bound catalogues: 8¼ x 11 inches. For use in loose leaf binders we recommend the adoption of sheet 9½ x 11. Ordinarily the printing space on either sheet will be the same, the loose leaf sheet being wider to permit of its being inserted in the loose leaf binders, the necessary margin for binding being greater than in the regular bound books. Printing space or type form should not be over 6¾ x 9¼ inches on either bound catalogues or on sheets for loose leaf binders.

W. K. MORISON & CO.'S FIRE.

THE large Hardware establishment of W. K. Morison & Co., 247 and 249 Nicollet avenue, Minneapolis, Minn., was the scene of a disastrous fire on the 8th ult. The loss was in the neighborhood of $110,000. About $30,000 of this amount was on merchandise actually destroyed by fire, the remainder representing the damage from water, the fire department having played more than twenty streams into the building and on the stock for two or three hours. The insurance has not yet been adjusted, and the matter will probably be referred to a board of arbitration. The company has opened a small store in which to do business temporarily and until the former quarters are in shape to occupy again, and will be pleased to receive catalogues, price-lists, &c., from manufacturers to take the place of those destroyed in the fire.

AMONG THE HARDWARE TRADE.

Penniman Bros. & Co., Asheville, N. C., whose business has been managed by Miss Penniman for the past ten years, have sold out to Ottis Green Hardware Company, which is moving into a new store.

The Newfane Hardware Company, Newfane, N. Y., incorporated with a capital stock of $20,000, has bought the Hardware business of Pettit & Pettit and the Furnace and Tinsmith business of Mortimer & Flint. In addition to carrying on these lines the company will handle Agricultural Implements.

The Forbes Hardware Company, Limited, has taken over the business of A. M. Forbes Company, Vancouver, B. C. Besides doing a General Hardware, Stove and Furnace business it will enter upon the manufacture of Tin Cans and other Tinware.

R. Cruzen Company, Paxton, Ill., has been succeeded by C. A. Nordgren, who for several years past has been the owner of practically all the capital stock of the company. Mr. Nordgren has now acquired the entire capital stock, assumed all liabilities and will hereafter conduct the business under his own name.

Byron E. Walter, South Milwaukee, Wis., recently completed extensive improvements in his store, which has been considerably enlarged. The old quarters are now devoted to Builders' Hardware, Cutlery, Sporting Goods, Kitchen Goods, &c., while the additions are used for Wooden Ware, Farming and Garden Tools, Stoves and the like. The basement affords 1500 square feet of space and there is a 16 x 24 foot warehouse besides. Much attention has been given to the wide show windows, which extend the entire front of the building. Exceptionally good lighting has been secured by a private gas plant on the premises.

The Hay Bros. Hardware Company has been incorporated at Amery, Wis., by John P. Hay, Clarence O. Hay and Ida M. Hay. The capital stock of the company is $5000.

TRADE WINNING METHODS

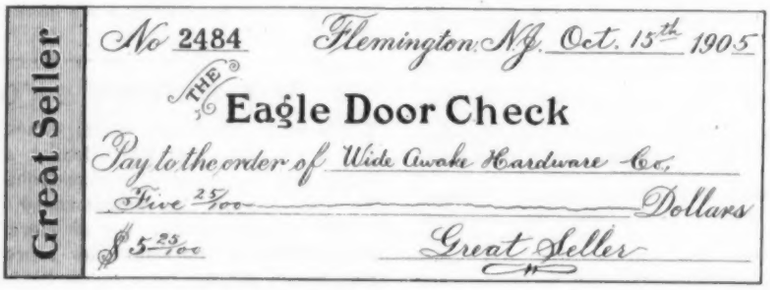
This department is for the description of approved methods of carrying on and extending business, and a cordial invitation is given to merchants to co-operate in the effort to make it suggestive and of practical use to the trade.

A DOOR CHECK ADVERTISEMENT.

WE are indebted to a correspondent for a suggestion for advertising Door Checks in an original and effective way. This involves an amusing pun on the word "check," and may be applied to any brand which a merchant happens to sell. One way of using the idea is to make a tinted showcard in the form of a check, as shown herewith. Substitute the name of the proper city or town with the correct date, also the name of the particular brand carried and the right selling price, inserting the firm name as payee. From this card hang another, white in color, reading something like this:

> This check is GOOD AS GOLD because it is INDORSED by leading architects.

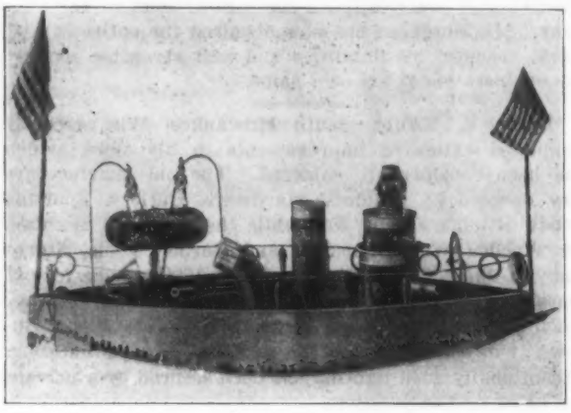
The same representation of a check could be employed as a circular printed on paper of the proper size and distributed or mailed to people who might be interested. It might also take the form of a private mailing card. The idea is so good that it would doubtless attract attention and afford good advertising even with people not interested in the commodity referred to.



Form of Showcard or Circular.

ANOTHER BATTLE SHIP.

INSCHO & INSCHO, Hardware merchants, Tioga, Pa., arranged the window exhibit illustrated herewith. The constructive parts were all taken from stock. The hull consisted of two Cross Cut Saws bolted together at the ends and sprung around the deck, which was ⅛-inch material sawed to fit. The railing was Copper Wire, Chisel handles furnishing the posts. Flagstaffs were pieces of Bamboo Fish Poles. Can Rubbers supplied the life preservers. The large life buoy was a piece of Rope wound with white cloth. The steering wheel was a wheel from a small express wagon. The lifeboat was a Round Loaf Bread Tin, with pieces of Jack Chain for fastening the tackle. Belt Lacers run through Clothes Line Pulleys supplied the tackle. The anchor was a Ceiling Hook with a Jack Chain attached. Conductor Pipe served for the smokestack and Elbows for the ventilators. The turrets were pieces of Stove Pipe with holes punched in them. The lower turret guns were Wood Faucets, the upper ones Brass Hose Nozzles. The searchlight was a Bicycle Lamp, which was lighted during the evening. The guns on deck were Wood Faucets mounted on Sash Rollers with a Wardrobe Hook screwed in back end for carriage. The ammunition consisted of .44-caliber Cartridges and 12-gauge Shells. The propeller was a Food Chopper Cutter. A child's Pencil Box furnished the torpedo.



Battle Ship Window Exhibit.

THE SHOW WINDOW.

BY F. B. M.

THE writer's idea of a show window is that in order to sell seasonable goods, get rid of an overstock or push a new article the way to obtain the best and quickest results is to devote one window solely to the article you wish to make a run on. In the case of a large store the window selected should always be one adjoining the door, so that after people see the display they may the more readily drop in than if the display were made in a window remote from the door.

A WINDOW IS REALLY A SALESMAN.

Now what would you think of a salesman when he went to sell goods if he tried to show you a thousand and one articles at once? And yet this is just what some dealers try to do with their windows. An up to date window is never overcrowded. A window should be looked upon just the same as a mouse trap. If you set a mouse trap with its most attractive bait and at the same time place all around it a lot of other eatables on the floor how many mice would you catch? While if you set the trap and are careful to take away everything else that would possibly distract the mouse from the trap and its bait you will be far more likely to succeed. I do not mean by using the term trap to deceive customers, for I believe that honesty is not only the best policy but the only policy.

TOO MUCH SAMENESS.

While some large Hardware stores have expert window dressers and show card writers, it is an undeniable fact that if you travel from place to place you cannot but observe, if you stop to think about it, that there is more or less sameness about Hardware store show windows.

It is really refreshing to come upon a Hardware window with an attractive show card hanging up or some novel design or grouping of Hardware. Of course it is speaking generally to say that so many Hardware windows "look alike to me." There are striking and marked exceptions, but these exceptions are, comparatively speaking, few and far between. This is not due to any lack of enterprise on the part of the dealer; in fact, Hardware dealers are as a rule very enterprising, yet it is not more

than a year ago while talking to the proprietor of a Hardware store that he excused himself to me to call a clerk from the window to wait on customers, and as the clerk passed us, leaving the window in derangement, this same manager found fault with the man for "spending so much of his time fixing up the window instead of waiting on customers." "Don't you see the store is full?" he said to the clerk.

THE CLERK GOT RED IN THE FACE,

but went on and said nothing. Yes, he went on and waited on customers as ordered, but how about the half finished window? It is true the store was full; in fact, crowded, but what made it so? Did this dealer ever stop to think that it might have been the display in the window that had something to do with the store being full of waiting buyers and that such being the case it would be cheaper for him to hire an extra clerk to wait on customers rather than scold an enterprising clerk for spending so much time in dressing the window which was helping to sell goods?

IT IS NO TROUBLE TO SELL GOODS

if you can get customers to come into your store and ask for certain articles that they saw in the windows. If you would sell the article that you put on display, as well as something else after you get the people in the store and a crowd on the sidewalk gazing at your window, then bare the window as far as possible, no matter how much you put on exhibit in another window, and do not forget what I have already said regarding the mouse trap principle as applicable to a store window.

A BUDGET OF HARDWARE ADS.

THE store of the John E. Bassett & Co., New Haven, Conn., which is familiarly known as "Ye Olde Hardware Store," the business having been established in 1784, is one of the enterprising and successful retail houses of New England. Special attention has of late years been given to advertising, both newspaper and otherwise, and the originality and uniqueness of the store's announcements have proved effective in securing the notice of the public, and incidentally increasing sales and profits. Herewith we reproduce (reduced in size) the first of a series of Hardware ads. which the company is now using in the daily press, the announcements being also printed on slips for inclosing in envelopes for circulation through the mails and in the store. The attractive and suggestive illustrations were prepared especially for the company's use by a local artist.

A Budget of Hardware Ads. (Reduced in Size); Also Printed on Slips for Circulation through the Mails and in the Store.

SPECIAL WAGE EARNERS' SALE.

DURING September, E. M. Austin, Litchfield, Ill., conducted what he termed a "Special Wage Earners' Sale." Mr. Austin issues posters every month, the edition being about 4000, sent all over his territory in Central Illinois, and in the September sheet called particular attention to the attractive prices current during this sale on Hardware, Stoves, furniture, carpets, rugs, oilcloth, &c. In addition to a cash business this merchant also offers goods on the "monthly payment" plan, and during the month offered special inducements to those looking for credit. Liberal advertising space in the local papers was also used to draw the public's attention to the sale.

TRADE ITEMS.

THE LEAVITT MACHINE COMPANY, Orange, Mass., is calling special attention to the Perfection Barrel Swing which it has been making for several years. This device is referred to as the first and only practicable fixture for swinging a barrel from the pantry, cupboard or broad shelf or counter in the grocery or Hardware store. It has been well advertised to the general public and now finds a ready market through the Hardware trade.

NEAL & BRINKER COMPANY, 18 Warren street, New York, is sole selling agent in the United States for the Besnard Automobile Lamps and Stella generators made in France for Automobiles, Motor Cycles, Boats, Canoes, &c. A new catalogue of the line is now ready for distribution. The acetylene gas, generated from carbide, supplies from 800 to 9000 candle-power, the Lamps listing from $12 to $128.

ON October 25 a fire occurred in the factory of the O. C. White Company, Worcester, Mass., manufacturer of Adjustable Fixtures for Incandescent Lamps. Although destruction of the property was threatened the flames were checked so that all machinery and tools were saved and the stock suffered most from smoke, water and chemicals. The company reports that it expects to ship orders as usual after the adjustment of the insurance and the completion of temporary repairs, which will take about a week.

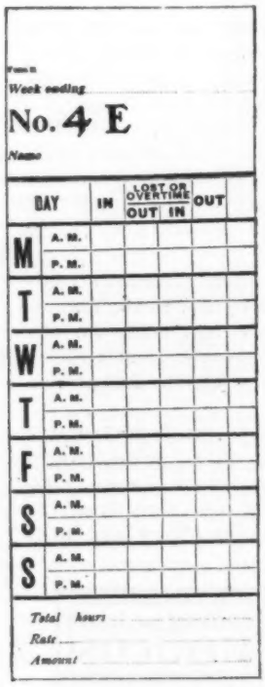
The Dickerman Hardware & Supply Company, Wallingford, Conn., has recently placed a contract for a new brick building 62 feet wide by 72 feet deep, two stories high. It will be ready for occupancy by January 1, it is expected. The building will be fitted up with all the modern appliances for conducting an up to date business in Hardware, Mill Supplies, Woodenware, Paints, &c.

FACTORY COST AND BUSINESS METHODS.

COST SYSTEM OF THE BILLINGS & SPENCER COMPANY.

First Article.

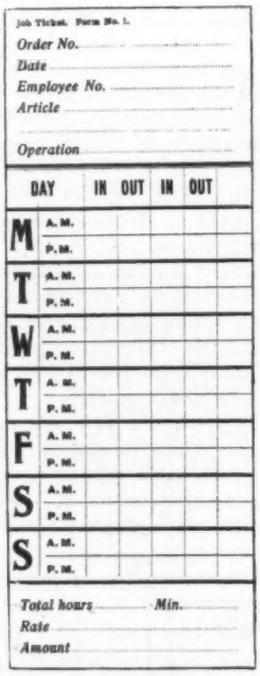
THE cost system in successful use in the works of the Billings & Spencer Company, Hartford, Conn., is an excellent illustration of the gradual improvement of a complicated system until much of its intricacy has been eliminated, leaving what is absolutely necessary for the accurate keeping track of costs, of payroll, of


Form B
Week ending
No. 4 E
Name

DAY		IN	LOST OR OVERTIME OUT	LOST OR OVERTIME IN	OUT
M	A. M.				
	P. M.				
T	A. M.				
	P. M.				
W	A. M.				
	P. M.				
T	A. M.				
	P. M.				
F	A. M.				
	P. M.				
S	A. M.				
	P. M.				
S	A. M.				
	P. M.				

Total hours
Rate
Amount

Fig. 1.—Workman's Weekly Time Ticket.


Job Ticket. Form No. 1.
Order No.
Date
Employee No.
Article
Operation

DAY		IN	OUT	IN	OUT
M	A. M.				
	P. M.				
T	A. M.				
	P. M.				
W	A. M.				
	P. M.				
T	A. M.				
	P. M.				
F	A. M.				
	P. M.				
S	A. M.				
	P. M.				
S	A. M.				
	P. M.				

Total hours Min.
Rate
Amount

Fig. 2.—Workman's Job Ticket.

stock and of comparative productiveness of workmen and machinery. All this is accomplished by the labor of one clerk to each 100 employees. The records are maintained in the department offices instead of in the main office, the exception being where a department is so small that the services of a clerk for that particular department are not worth the while, when the clerk of some other department does the work and keeps the records. Each department having its own letter, no complication results from this doubling up, every workman's number being coupled with his department letter, as D 43, A 17, and so on.

The Basis of the System

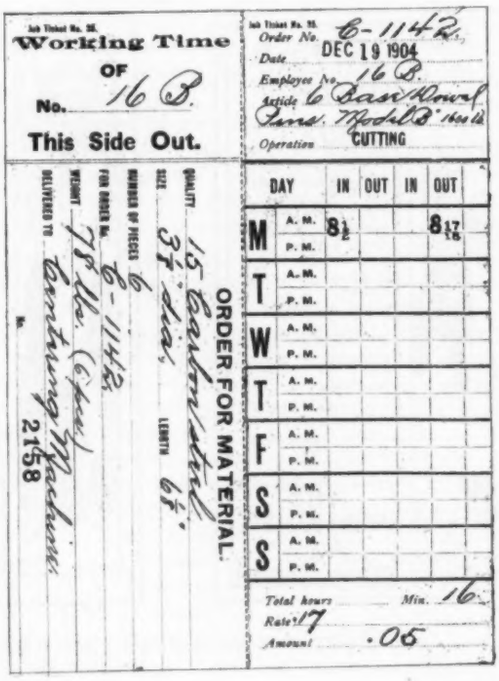
consists of two general types of tickets which are handled by the employees. One is known as the weekly ticket which is a record of the workman's time for the entire week, or where piece work is employed a record of the work he has done under that system. The other is the job ticket, one of which is issued for every job the workman is given. If he performs several operations on the same piece he has a separate job ticket for each. When the job is completed these tickets come back for filing under the order number. In considering the system in detail it is advisable to take up two different departments, the Machine Department and the Small Tool Department; the methods employed in them will illustrate those followed in the entire establishment, thus giving a complete description of the general system.

The Weekly Ticket,

Fig. 1, is that used in the Machine Department, the system of which will be first considered in this article. It is retained by the workman for the entire working week. It will be noted that the two blanks of each line, under the head of "lost or overtime," against each a. m. and p. m., are for overtime work, or as is more often the case for time that a workman is out of the works during a half day—that is, when he leaves work and returns before the end of the half day. This card is of a light buff color printed in black. The reverse side is the duplicate of the face so far as blanks for stamping are concerned, excepting that the printing is in red ink. This side is intended as a reserve space for use where the workman's time is so cut up as to leave insufficient room on the face for a complete record. "This side out" appears on the top of the reverse side that the workman may not make the mistake of registering in or out on the wrong side of the ticket when he stamps his time on the Rochester time recorder, one of which is in each department.

The Job Ticket

already referred to is printed in a variety of colors to assist in the easy classification of work and for the general benefit of all concerned in the handling of the system. Referring to Fig. 2, it will be seen that the job ticket contains the order number, date, employee's number, the name of the article and that of the operation. The ticket is stamped on the time recorder just as the weekly ticket is stamped. When the workman has completed one job and is to begin another he stamps in both tickets at the same time, which of necessity makes the total time of his job tickets balance the time of the weekly ticket. Or it may be that he is interrupted in one job before it is completed, in which case he stamps its ticket with the time at which he ceases work and stamps in the new ticket at the same time. On the job ticket at the bottom are blanks for the total hours and minutes that the job has taken to perform, the workman's wage rate per hour and the amount that he has earned. On the reverse side of the ticket the clerk has stamped the general character of the work, as "Miscellaneous order, production account," "Stock order, drop


Working Time
OF
No. 16 B.
This Side Out.

Order No. C-1142
Date DEC 19 1904
Employee No. 16 B.
Article 6" Bastard Round Cast Steel
Operation CUTTING

DAY		IN	OUT	IN	OUT
M	A. M.	8½			8 17/18
	P. M.				
T	A. M.				
	P. M.				
W	A. M.				
	P. M.				
T	A. M.				
	P. M.				
F	A. M.				
	P. M.				
S	A. M.				
	P. M.				
S	A. M.				
	P. M.				

Total hours Min. 16
Rate 17
Amount .05

ORDER FOR MATERIAL.
DELIVERED TO Centering Machine
2158
WEIGHT 78 lbs. (Gross)
FOR ORDER No. C-1142
NUMBER OF PIECES 6
SIZE 37" dia.
QUALITY 15 Carbon steel
LENGTH 6½"

Fig. 3.—Job Ticket for Cutting Stock with Order Attached.

hammer account," and so on. Also on the reverse side, at the top, are the words: "Working time of No. ——. This side out."

Cutting Material.

A special job ticket, Fig. 3, is provided where stock is to be cut off. An order for material is attached to the ticket, perforated to be easily torn off. The employee having this to do presents his order for material, which contains a detailed description of the stock required, together with a description of the size and number of pieces, their combined weight and the order number. The

order detached from the job ticket is delivered with the cut off pieces to the stock room and remains with the material until the first operation is performed, the workman having this latter job, returning the order for material to the office, where it takes its place under its job number, to enter into the account of cost of the job. When this order is issued

A Stock Memorandum,

Fig. 4, is sent to the stock room, filled out to correspond with the job ticket order. This memorandum is held in the stock room until the pieces are finished. After the stock room clerk has compared the number of pieces received with the order and with the stock memorandum and inspected the work to see that it is up to standard he makes the proper indorsement upon the memorandum and returns it to the office. This is a valuable feature of the system for another reason than as a check upon the workman. Oftentimes in cutting up stock it is economical to produce more or less than the actual number

Order No. C-1142. *Date,* Dec.19,1904.

STOCK MEMORANDUM.

Article Base Dowel Pin.

No. of Pieces 6.

For 1800 lb. Modal B. Drop Hammer.

NUMBER TURNED IN.

DATE.		DATE.
Dec. 20	6 pieces.	

Material received in good order.

James Bell, (Stock clerk.)

Fig. 4.—Stock Memorandum Indorsed by Stock Clerk.

of pieces ordered, and in figuring costs this should be taken into account. The cost of other materials, such as castings, are charged direct from requisitions to the cost memorandum, which will be shown in a subsequent diagram.

(To be continued.)

FARMERS NOT WILLING TO BE KNOWN BY NUMBERS.

A PROMINENT Minnesota Hardware merchant directs attention to another consideration which should operate against the now famous post office order (temporarily suspended and pretty certain to be revoked) which would have permitted the delivery of matter to rural mail boxes by number simply, the name of the box owner being unnecessary so long as the number of the box, the number of the rural delivery route and the name of the State were supplied. This sidetracking or suppression of the name of the recipient is referred to by our correspondent as not to the liking of the farmers, many of whom are proud of their names and vocation and not disposed to bury their identity in a phlegmatic numeral. One of our correspondent's farmer friends, a well-known and successful agriculturalist, expresses his sentiments in a local paper as follows:

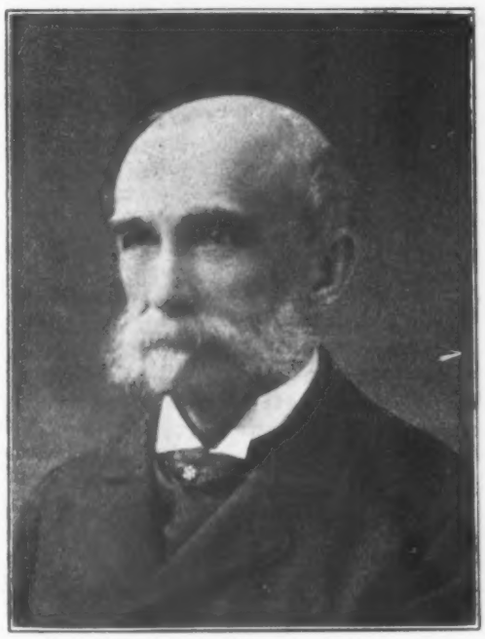
We hear considerable in these days about the autocratic tendencies of the Government, but this order of the Government to call us who live on rural routes by number is certainly the limit. I am of the opinion that every man who has a name which he honors will resent this scheme of calling us by number as they do at the penal institutions of the State. I for one resent it, and I believe my neighbors will also resent it. If we are to be written to as "Number Seven" or "Number Thirteen," as they are called at ——, it is only a step till we are nicknamed that, and if I am to live in my community and am to be entitled to the ordinary respect of my neighbors I want to be written to and addressed by name and not by a convict's number.

It is not unlikely that there are multitudes of farmers whose view of this matter is identical with the position taken above.

DEATH OF HENRY WILCOX.

HENRY WILCOX of Baltimore, Md., died Monday, October 23, at his residence in that city, aged 76 years. While his health had been failing for several years, Mr. Wilcox took an active interest in the business of the house he founded until within the last two weeks, when he was confined to his home.

Mr. Wilcox is said to have been the oldest hardware man in continuous service in Baltimore. He founded the house of Henry Wilcox in 1850, which was subsequently succeeded by Henry Wilcox & Bro., and later by the present Wilcox Hardware & Iron Company. Mr. Wilcox claimed to have been the first house, or among the first Baltimore houses, to subscribe to *The Iron Age*, and



HENRY WILCOX.

about the first firm in that market to sell machine made Horseshoe Nails manufactured in America. He was much interested in local affairs, and was instrumental in organizing one each of the leading banks and fire insurance companies of Baltimore. He continually declined political preferment, and having lost his wife thirty years ago devoted all of his time outside of business affairs to the promotion of the comfort and happiness of his family.

His death is the first that has occurred among the immediate descendants of his family in half a century. Six brothers and one sister survive him, together with three daughters and one son, the latter with a brother of the deceased having been for some time interested in the business and who will continue it as heretofore.

PHILIP CORBIN, president of the American Hardware Corporation, New Britain, Conn., was 81 years old on the 26th ult. He received a number of congratulations on his anniversary, which was spent quietly and without celebration of any kind. Mr. Corbin enjoys excellent health and every day finds him at the offices of the great company of which he is the head looking after the direction of its vast business.

OHIO HARDWARE ASSOCIATION.

THE Executive Committee of the Ohio Hardware Association held a meeting at the New Courtland Hotel, Canton, on the 19th ult. Among other matters the committee discussed some changes in the constitution and by-laws, which will be brought up for consideration at the next annual convention in February, and the scope of the programme for that occasion. The committee regards the question box as the most practical and profitable feature of the meetings of the association and will give it greater prominence at the coming session than ever before. The secretary was instructed to ask every member in the State to prepare questions vital to his own personal business and forward them to the secretary. These questions will be submitted to the Question Box Committee for discussion in the convention.

The Auditorium Building in Canton was rented by the Executive Committee for the three days of the convention, February 27 and 28 and March 1, 1906. This fine building is ideal for the purpose. The sessions will be held in the Auditorium. The banquet will be given in that part of the Auditorium known as the "pit," already famous for banquets. The Auditorium is surrounded with rooms admirably adapted for exhibits by jobbers and manufacturers. Space in these rooms will be rented to exhibitors at reasonable rates. The committee believes that this arrangement can be made entirely satisfactory and profitable to both the retail merchant and the exhibitor and at the same time overcome annoyances that have heretofore proved very troublesome to all parties concerned.

The Canton Committee of Citizens, headed by J. B. Brothers of the Canton Hardware Company, is deeply interested in the coming convention and purpose to sustain the city's reputation for hospitality.

J. S. BARRON & CO.'S NEW BUILDING.

J. S. BARRON & CO., wholesalers and exporters of Wooden Ware, Cordage, House Furnishing Goods and the numerous related lines, have moved into their fine new granite and brick building on the southwest corner of West Broadway and Franklin street, New York. The building was erected by them on the site occupied by their former building, which was totally destroyed by fire April 15, 1904. The structure, numbered from 200 to 206, inclusive, on West Broadway and 127 to 129 on Franklin street, is of cream colored brick above the lower courses of granite, there being eight stories and basement, all of which are occupied by J. S. Barron & Co. The floors above the office are of cement, with ceilings and walls of asbestos, finished with lime plaster, thus making the building fire proof in itself. On every floor are lengths of fire hose connected to water stand pipes, by means of which any part of any floor can be instantly reached with water by turning a valve. There are electric elevators for both passengers and freight and the various business conveniences which are recognized as necessary in conducting a thriving business. Their export trade is continually increasing, especially to such territory as South Africa and Australia. This important part of the business is at present in charge of Ogden E. Parker, assistant to W. H. Addoms, the head of that department, who for some months has been in East Africa in the interest of his house, which is owner of an important concession from the British Government for the production and exportation of a new Rope Fiber, which is about to be put on the market.

NORTH DAKOTA HARDWARE ASSOCIATION.

THE NORTH DAKOTA RETAIL HARDWARE ASSOCIATION will hold its annual meeting on January 30 and 31, 1906. These dates have been selected so as not to conflict with those of other State Hardware association conventions.

A. E. Driskell, Haddam, Kan., has sold his stock of Hardware and furniture and is retiring from business.

CONTENTS.

SEWING MACHINES A PROFITABLE LINE FOR THE HARDWARE MERCHANT.

BY G. H. D.

DOES any Hardware man doubt that every family will have a Sewing Machine as quickly as circumstances will permit? The outlook is for a large trade in all lines this fall. Farmers have money, are getting more, and are buying Sewing Machines more freely than ever before. The farmers are coming to town these days "with money in their jeans," and the housewife who sewed by hand last year is buying a Sewing Machine this season.

Day of the Exclusive Dealer Past.

Machine sewing has passed all stages of experiment, novelty or doubt. Shuttle Machines for family use are now so well known, and the mechanism is so simple and reliable, that the day of the expert and exclusive Sewing Machine dealer is past. This naturally puts the Sewing Machine on the plane of established merchandising, the same as any other useful article or household necessity. If the Hardware dealer will take up the sale of Sewing Machines and give this line as much time and attention as he devotes to other specialties or lines the patronage of his customers in this profitable line is only a matter of time, considering that he has the advantage of handling an article for which there is a certain and staple demand the whole year round.

A Compatible Line.

There is really nothing incompatible in handling a general line of Hardware and selling Sewing Machines. Some of the most successful Sewing Machine dealers in the country to-day are also dealers in Hardware, furniture, &c. Other things being equal, the Hardware dealer has the advantage over all other dealers. His other lines and varied stock help to advertise the Machines, bring customers and divide expenses.

The Hardware dealer, although he may do a wagon business also, depends on selling most of his Machines at his store, for the main reason that the store trade is the most satisfactory as well as the most profitable. Sewing Machines will not sell themselves, but in order to make a success of the business the Hardwareman must give the Sewing Machine customer the same amount of time and attention as he would in selling any other profitable article.

Hardwaremen Distribute Half the Product.

It was in 1877 or thereabouts that the first great drop in the retail price of Sewing Machines took place. This was primarily due to the fact that about this time the essential patents on Sewing Machines expired and the main principles of sewing machine construction became common property. The old method of retailing Sewing Machines through agents, however, remained the same until about 1878, when nearly all the leading Sewing Machine companies of that time offered a sweeping reducton to their agents in the wholesale price. This large cut in price marked the beginning of the renaissance in the Sewing Machine world. With this new birth came the Hardware dealer into the Sewing Machine business, but although his conversion was gradual, and although it took years on the part of the companies to overcome his fears and prejudices against selling Sewing Machines, he is now in the business to stay, and it is safe to say that the Hardware dealer to-day distributes fully 50 per cent. of all the Sewing Machines made in the United States.

The up to date Hardware dealer must necessarily add new departments to his stock in order to keep pace with his ideas of expansion and his natural desire to increase his business, and many are beginning to see that they can retail Sewing Machines to good and profitable advantage direct from their stores—of course not at so high a price as the old time canvasser secured, but yet at a price that draws trade and leaves them a fair margin of profit. On the other hand, they avoid the expense of canvassers, horses and wagons, extra operators and teachers, and as the operation of Sewing Machines is now so generally understood customers prefer to call on their local Hardware dealer rather than buy from a canvasser or stranger, believing that they will get a better article and at a more reasonable price, it also appearing more proper that the Hardware dealer who supplies their other wants should also furnish them a Sewing Machine.

The Natural Source.

To my mind the successful handling of Sewing Machines offers itself as a profitable specialty that can be easily handled by the Hardware dealer, and, besides, means a large saving to the consumer. I believe that it is admitted that nearly every housewife to-day knows how to run and operate a Sewing Machine, and with the aid of the instruction book furnished can take an ordinary family Sewing Machine and use it without trouble or difficulty. Why, then, should Sewing Machines not be purchased through the regular legitimate channels of trade? Granting this to be so, then the natural source through which they should be sold is the local Hardware dealer.

Why Hardware Merchants Hesitate.

I believe the reason many of the Hardware dealers hesitate to take hold of Sewing Machines is because they do not understand the line. They imagine it will be necessary to have additional help and experienced operators of Sewing Machines. Experience, however, has proven this entirely unnecessary. The principal requirement for the Hardware dealer is that he thoroughly convince himself that he is selling a line of family Sewing Machines that are second to none on the market. With this confidence he recommends his Sewing Machines to his customers in the same manner he does any other article which he feels is thoroughly reliable. They embody all late and tested improvements and are furnished to the Hardware merchant at a price which does not include the $3 to $5 selling expense necessary for the old line traveler to add to the cost of his Machines. The Machines are warranted both by the factory and the jobber, making a double—good as gold—warranty.

An important feature of the Hardware dealer taking up Sewing Machines is the supreme fact that he can offer the customer a large saving in the matter of price. This will at once prove interesting to the purchaser, so that all there remains is for the Hardware dealer to convince the customer that he is furnishing as good a Sewing Machine as can be made and saving him money besides.

A Distinct Class.

Sewing Machines for household use form a distinct class and vary little in regard to size and general design. The most important differences are found in the style of stitch used and the manner in which it is executed. Of the two stitches produced by the family Sewing Machine the lock stitch is by far the more extensively used. For ordinary family sewing it has been demonstrated by experience that the chain stitch is inferior to the lock stitch in many respects, and as a consequence the manufacturer of chain stitch Machines for household use has been practically discontinued.

On the other hand, chain stitch Machines are extensively manufactured for factory use. This is due in a large degree to the extreme elasticity of the stitch, which makes it especially desirable for sewing knit goods and other materials inclined to stretch.

The Lock Stitch Machines

are divided into three classes, distinguished by the nature of the shuttle used to assist in executing the stitch—namely, the rotary, the vibratory and the oscillating motion. The vibrating shuttle is most extensively—in fact, almost universally—used in connection with family Machines. Over 80 per cent. of the family Machines sold to-day execute the lock stitch made on the vibrating shuttle Machine.

It is therefore obvious that the Hardware dealer will do better and be able to sell more Machines if he will take up and push some good, reliable, vibrating shuttle Machine, but it must be a good Machine, one that he can strongly and honestly recommend and guarantee to his friends and customers. No Hardware dealer can expect to do well with poor, cheap, low priced Machines anywhere. To secure the most profit out of the line he should study the needs of his territory and confine him-

self to supplying the principal demand rather than to try to catch the stray customer who wants something much out of the common run.

Buy a Few at the Start.

The up to date Hardware dealer who takes up the line with the idea of accomplishing something "worth while" buys a few to start on and places them in the front part of his store, where the Machines can be seen and noticed. When customers come in their attention is called to the Sewing Machine, how good it is, the nice work it will do and why it was selected above any other. He advertises the line in his local paper and all his friends and customers know he is selling Sewing Machines and handling the "best" Machine on the market. He sells a few Machines the first year and more the next; pays his bills promptly, makes money on every Machine he sells, likes the business, finds the line is easy and profitable to sell and continues to handle Sewing Machines as long as he is in business.

Through Several Years' Actual Contact

with the trade I often wonder why more Hardware dealers do not undertake the selling of Sewing Machines, knowing as I do that with the same attention and investment Sewing Machines will pay as good or a better profit than many other side lines the Hardware dealer is now carrying. On the other hand, there is no wonder that some dealers fail in this business, as they do in other lines, for no business will succeed without proper attention, and no article will sell, no matter how essential or necessary, unless properly presented to the customer. Experience has shown that where the Hardware dealer takes up Sewing Machines and gives the line the same time, care and attention which he devotes to his other business the Sewing Machine business will pay any Hardware dealer nicely that takes it up.

PRICE-LISTS, CIRCULARS, &c.

Manufacturers in Hardware and related lines are requested to send us duplicate copies of catalogues, price-lists, &c., one copy for our catalogue department in New York and another for our London office; and at the same time to call our attention to any new goods or additions to their lines, of which appropriate mention will be made besides the brief reference to the catalogue or price-list in this column.

FOREST CITY BIT & TOOL COMPANY, Rockford, Ill.: Catalogue G covering a comprehensive line of Wood Boring Bits, Hollow Mortising Chisels, common Mortising Chisels, &c.

UNITED STATES STAMPING COMPANY, Moundsville, W. Va.: Catalogue No. 3, illustrated in colors, listing a complete line of Enameled Steel Ware and Sheet Iron Dripping Pans.

SOUTHERN PLOW COMPANY, Columbus, Ga.: Illustrated catalogue and price-list of Steel and Cast Turning Plows, Steel Plow Shapes, Double Shovel Plows, Cultivators, Harrows, single and double Plow Stocks, Cane Mills, Cotton Planters, &c.

GENERAL GAS LIGHT COMPANY, Kalamazoo, Mich.: Handsomely illustrated catalogue with trade price sheet of Humphrey Gas Arc Lamps, gas lighting appliances and accessories.

CARTER WIRE FENCE MACHINE COMPANY, Mount Sterling, Ohio: Catalogue of Carter's Woven Wire Fence Machine.

WEST COAST WIRE & IRON WORKS, San Francisco, Cal.: Booklet referring to Lamb Woven Wire Fencing.

BILLINGS & SPENCER COMPANY, Hartford, Conn.: Illustrated price-list of Ratchet Drills.

STAR CORUNDUM WHEEL COMPANY, Detroit, Mich.: Illustrated price-list referring to Star Oil Stones, Scythe Stones, Razor Hones, Knife Stones, &c.

AFRO-AMERICAN TRADING & NAVIGATION COMPANY.

THE AFRO-AMERICAN TRADING & NAVIGATION COMPANY, whose office and headquarters are with J. S. Barron & Co., 200-206 West Broadway, New York, is the name of a company organized in 1902 for the production of a new Rope fiber found in British East Africa. The fiber is a vegetable growth of reed or cane like character, giving, it is said, a tensile strength 16 per cent. greater than that of manila fiber, which supplies only about 30 per cent. of the demand for Rope and Cordage manufacture, it is estimated. The plant was discovered by F. A. G. Pape, an Englishman, who brought it to the attention of J. S. Barron & Co., New York, jobbers of Wooden Ware, Cordage, &c. A company was at once organized with $100,000 capital, all of which is taken up, the interval since organization having been employed in securing a concession from the British authorities and the purchase and erection of the necessary plant by which to prepare the fiber for shipment in condition to be manufactured into Rope. The concession covers 150 square miles of territory, which is reached by both river and rail transportation, and is inland about 100 miles from Mombasa, a seaport on the Indian Ocean, about 150 miles north of Zanzibar. This fiber somewhat resembles sisal in general appearance, is long and of great strength, but, unlike sisal, we are informed, will not kink in water. It will be marketed in competition with sisal. William H. Barron, head of J. S. Barron & Co., is president of the company, F. A. G. Pape vice-president, William H. Addoms secretary and Charles D. Orth treasurer. The first shipments in merchantable quantities are expected early in the coming year.

REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate.

FROM WEBB HARDWARE COMPANY, which has purchased the business of T. L. Roberts & Co., Webb, Iowa.

FROM W. D. JOHNSON, Morrowville, Kan., who has succeeded Johnson & Flansbury in the Shelf and Heavy Hardware, Stove, Paint and Sporting Goods business.

FROM DAWSON & WHANNEL, Traer, Iowa, successors to Daniel & Staveley in the Hardware, Stove, Implement and Sporting Goods business.

FROM N. C. SMITH, Climax, Kan., who has bought the Hardware, Stove and Implement business of C. T. Russell.

FROM J. W. MCCARTY & Co., Liberal, Mo., purchasers of the Hardware, Stove, Harness and furniture business of Leverty Bros.

FROM OTTIS GREEN HARDWARE COMPANY, Asheville, N. C., successor to Penniman Bros. & Co., dealers in general Hardware, Building Materials and Farming Implements.

FROM JAMES H. LAURIE HARDWARE COMPANY, which is transferring its wholesale and retail business from Alamogordo, N. M., to El Paso, Texas.

F. E. MYERS & BRO., Ashland, Ohio, manufacturers of Pumps, Hay Tools, Door Hangers, &c., were awarded a gold medal on their elaborate exhibit at the Lewis and Clark Exposition at Portland, Ore.

The Heron Lake Hardware Company, Heron Lake, Minn., has been organized by F. W. Garlock and E. A.

Francis to conduct the retail business previously done under the name of the former.

Swedish Iron Shingle Nails.

Henry J. Miller's Sons, Bridgewater, Mass., are to begin the manufacture of a complete line of Swedish iron shingle nails, in addition to their regular line of shoe tacks and shoe nails. Swedish charcoal iron will be imported for the purpose and every keg of nails will be sold under this brand. The firm reports that a good tonnage of orders for the new product has already been booked.

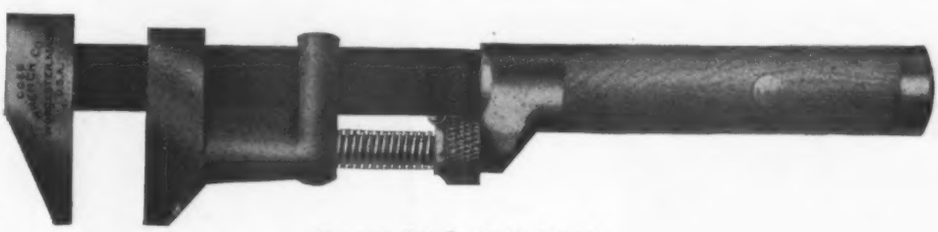
Gas Portable C 1093.

The Turner & Seymour Mfg. Company, Torrington, Conn., which is now making a large line of gas portables, has of late been making a feature of the special style shown herewith, known as C 1093. This portable is made of a fine gray iron casting and is furnished in several different finishes, a specialty being made of the verde green or antique bronze finish. It stands 12 inches high and has an 8-inch spread of base. The company also makes a large line of candlesticks of the same material and furnishes these, as it does the general line of portables, in at least 15 different finishes, including the ones mentioned as well as dead black, silver, oxidized copper, brass or silver, imitation bronze, old brass or copper, burnished brass or copper and Japanese bronze. Having its own designer the company is able to offer the trade many new and attractive goods, and while these retail at a reasonable price it is stated that they afford the merchant a good margin of profit.

Gas Portable C 1093.

Hammer Handle Model Wrench.

The accompanying cut illustrates the new style of wood handle wrench brought out by the Coes Wrench Company, Worcester, Mass., as a companion to the company's steel handle model. It is designed especially to take the place of the latter wrench where people prefer a wood handle or where the wrench is not subjected to heat or moisture. The new style is called the Hammer Handle model. It fills the hand clear to the tip, and for this reason and because the handle is the same size throughout it is referred to as the largest one-handed wrench made. The absence of the swell in the handle allows the hand to grasp readily a wrench of the largest size, 21 inches, without straining. The handle casting is heavily webbed on both sides and in spite of the absence of swell the handle woods are heavier than on the old model. The tip is riveted heavily, and the cross rivet is heavier than ever used at this point. The wrench is said to be practically as strong as the steel handle style. In addition to this new style the Coes Company is placing on the market this month a larger size of the Key model wrench. This wrench is 48 inches long, is between 40 and 42 pounds in weight and opens 9 inches. This makes the third size of this wrench and what is stated to be the largest screw wrench ever put on the market. It is made, as are the smaller sizes, 28 and 36 inch, of high grade forgings and steel castings, and is especially suited for engine room work. This makes 44 sizes and five different styles of screw wrenches now manufactured by the Coes Wrench Company.



Hammer Handle Model Wrench.

Billings' Micrometer Holder.

The Billings & Spencer Company, Hartford, Conn., is putting on the market a handy device in the shape of a micrometer holder, as shown in the accompanying illustration, which is one-half the size of tool. The holder consists of two parts, a base and a clamp. The clamp is made to tilt at different angles and is furnished with parallel jaws. The piece to be measured may be held in one hand, leaving the other free to adjust the micrometer. The whole is case hardened finish, and in workmanship compares favorably with the micrometer itself. The tool is drop forged throughout and weighs 1½ pounds.

Billings' Micrometer Holder.

Columbian Screen Door Spring Hinge.

The Columbian Hardware Company, Cleveland, Ohio, has just put on the market the Columbian screen door spring hinge, shown herewith. It is said to be unusually simple in construction, being composed of five parts only; the two flanges of heavy wrought steel, two steel tips, and a heavy spring of the best oil tempered spring steel wire with holdback. The edges of the flanges are drawn down at right angles to form a bead, thus adding strength and giving a neat, beveled effect, while the spring itself is properly protected from the weather. The company states that the spring has broad bearing surfaces and is so coiled and attached as to swing a door quickly but evenly

Columbian Screen Door Spring Hinge.

and smoothly. The hinge is also referred to as shapely, well balanced and clean cut in appearance, the wrought steel surface being covered with an even coat of japan. A sample hinge will be sent free to merchants on application.

Little Giant Clothes Line Fastener.

The clothes line fastener shown in the accompanying cuts is made from steel, enameled. Fig. 1 represents the line after having been put up, with the surplus line coiled. After passing the line over the yoke at the top of the fastener it is pulled taut and is automatically held by the fastener. As an intermediate fastener the device is illustrated in Fig. 2, which shows how two lines can be fastened without drawing them through the yoke. To unfasten the line the top of the fastener is touched, when it will be instantly released. The device is offered by the West Michigan Machine & Tool Company, Grand Rapids, Mich.

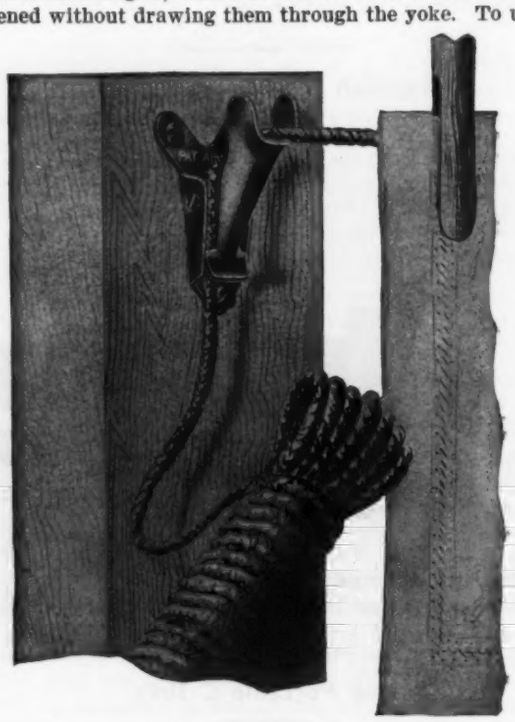


Fig. 1.—Little Giant Clothes Line Fastener.

Fig. 2.—Little Giant Intermediate Fastener.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	₱ gal.
Linseed, City, raw	45 @46
Linseed, City, Boiled	47 @48
Linseed, State and West'n, raw	43 @44
Linseed, raw Calcutta seed	@62
Lard, Extra Prime, Winter	60 @62
Lard, Extra No. 1	47 @50
Lard, No. 1	37 @42
Cotton-seed, Crude, f.o.b. mills	19 @20
Cotton-seed, Summer Yellow, Prime	26 @26½
Cotton-seed, Summer Yellow, off grades	@..
Sperm, Crude	50 @52
Sperm, Natural Spring	@..
Sperm, Bleached Spring	@..
Sperm, Natural Winter	60 @62
Sperm, Bleached Winter	63 @65
Tallow, Prime	51 @53
Whale, Crude	@..
Whale, Natural Winter	42 @44
Whale, Bleached Winter	44 @46
Menhaden, Brown, Strained	27 @28
Menhaden, Light, Strained	28 @29
Menhaden, Bleached, Winter	30 @31
Menhaden, Ex.-Bld., Winter	31 @32
Menhaden, Southern	16 @16½
Cocoanut, Ceylon	₱ lb 6¼@ 6⅝
Cocoanut, Cochin	₱ lb 8 @ 8½
Cod, Domestic, Prime	34 @35
Cod, Newfoundland	39 @40
Red, Elaine	29 @31
Red, Saponified	₱ lb 3¾@ 4
Olive, Italian, bbls.	63 @65
Neatsfoot, prime	49 @50
Palm, Logos	₱ lb 6⅛@ 6¼

Mineral Oils—

	₱ gal.
Black, 29 gravity, 25@30 cold test	10½@11½
Black, 29 gravity, 15 cold test	11½@12½
Black, Summer	10½@11½
Cylinder, light filtered	18 @19
Cylinder, dark filtered	16 @17
Paraffine, 903-907 gravity	12½@13
Paraffine, 903 gravity	11½@12
Paraffine, 883 gravity	9½@ 9½
Paraffine, Red	11½@13

In small lots ½¢ advance.

Miscellaneous—

Barytes, White, Foreign	₱ ton $17.50@19.00
Barytes, Amer. floated	₱ ton 18.00@19.00
Barytes, off color, No. 2	₱ ton 13.50@15.00
Chalk, in bulk	₱ ton 3.00@ 3.25
Chalk, in bbls.	₱ 100 lb .. @ .35
China Clay, English	₱ ton 11.00@17.00
Cobalt, Oxide	₱ 100 lb 2.50@ 2.60
Whiting, Common	₱ 100 lb .43@ .48
Whiting, Gilders	₱ 100 lb .50@ .55
Whiting, Ex. Gilders	₱ 100 lb .55@ .60

Putty, Commercial—₱ 100 lb

In bladders	$1.65 @1.85
In bbls. or tubes	1.15 @1.35
In 1 lb to 5 lb cans	2.60 @2.90
In 12½ to 50 lb cans	1.45 @1.85

Spirits Turpentine—₱ gal.

In Oil bbls.	71½@72
In machine bbls.	72 @72½

Glue—

	₱ lb
Cabinet	11 @15
Common Bone	7 @ 9
Extra White	18 @24
Foot Stock, White	11 @14
Foot Stock, Brown	8 @11
German Hide	12 @18
French	10 @40
Irish	13 @16
Low Grade	9 @12
Medium White	14 @17

Gum Shellac—

	₱ lb
Bleached Commercial	37 @38
Bone Dried	47 @48
Button	36 @45
Diamond I	@55
Fine Orange	45 @47
A. C. Garnet	@44
D. C.	60 @..
Octagon B	@52
T. N.	40 @42
V. S. O.	58 @..

Colors in Oil—

	₱ lb
Black, Lampblack	12 @14
Blue, Chinese	36 @46
Blue, Prussian	32 @36
Blue, Ultramarine	13 @16
Brown, Vandyke	11 @14
Green, Chrome	10 @15
Green, Paris	@24
Sienna, Raw	12 @15
Sienna, Burnt	12 @15
Umber, Raw	11 @14
Umber, Burnt	11 @14

White Lead, Zinc, &c.—

	₱ lb
Lead, English white, in Oil	8⅛@ 9½
Lead, American white, in Oil:	
Lots of 500 lb or over	@ 6½
Lots less than 500 lb	@ 7
In Barrels	@ 6
Lead, White, in oil, 25 lb tin pails, add to keg price	@ ⅛
Lead, White, in oil, 12½ lb tin pails, add to keg price	@ 1
Lead, White, in oil, 1 to 5 lb ass'ted tins, add to keg price	@ 1½

Lead, American. Terms: For lots 12 tons and over ¼¢ rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice, for lots of less than 500 lbs. net.

	₱ lb
Lead, White, Dry in bbls.	@ 6
Zinc, American, dry	4⅛@ 4¾
Zinc, French:	
Paris, Red Seal, dry	9½
Paris, Green Seal, dry	10¾
Antwerp, Red Seal, dry	8⅝
Antwerp, Green Seal, dry	10
Zinc, V. M. French, in Poppy Oil:	
Green Seal:	
Lots of 1 ton and over	12⅞@13¾
Lots of less than 1 ton	13⅛@13⅝
Zinc, V. M. French, in Poppy Oil:	
Red Seal:	
Lots of 1 ton and over	11⅝@12¼
Lots of less than 1 ton	11⅞@12⅝

Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or mixed grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors—

	₱ lb
Black, Carbon	5 @10
Black, Drop, American	4 @ 6
Black, Drop, English	5 @15
Black, Ivory	16 @20
Lamp, Com	4½@ 6
Blue, Celestial	4 @ 6
Blue, Chinese	29 @32
Blue, Prussian	27 @30
Blue, Ultramarine	4½@15
Brown, Spanish	½@ 1
Carmine, No. 40	$3.50@3.60
Green, Chrome, ordinary	3½@ 6
Green, Chrome, pure	17 @25
Lead, Red, bbls., ½ bbls. and kegs:	
Lots 500 lb or over	@ 6½
Lots less than 500 lb	@ 7
Litharge, American, bbls.	6 @ 6½
Ocher, American	₱ ton $8.50@16.00
Ocher, American Golden	2½@ 3½
Ocher, French	1¼@ 2½
Ocher, Foreign Golden	3 @ 4
Orange Mineral, English	10 @12
Orange Mineral, French	10¾@12¼
Orange, Mineral, German	8¼@10¼
Orange Mineral, American	8¼@ 8½
Red, Indian, English	4½@ 8½
Red, Indian, American	3 @ 3¼
Red, Turkey, English	4 @10
Red, Tuscan, English	7 @10
Red, Venetian, Amer.	₱ 100 lb $0.50@1.25
Red Venetian, English	100 lb $1.15@1.75
Sienna, Italian, Burnt and Powdered	3 @ 9½
Sienna, Ital., Raw, Powd.	3 @ 6½
Sienna, American, Raw	1½@ 2
Sienna, American, Burnt and Powdered	1½@ 2
Talc, French	₱ ton $15.00@30.00
Talc, American	₱ ton 15.00@25.00
Terra Alba, French	₱ 100 lb 90 @1.00
Terra Alba, English	₱ 100 lb 90 @1.00
Terra Alba, American, ₱ 100 lb., No. 1	60 @70
Terra Alba, American, ₱ 100 lb., No. 2	45 @50
Umber, Turkey, Bnt. & Pow.	2½@ 3½
Umber, Turkey, Raw & Pow.	2½@ 3½
Umber, Burnt, Amer.	1½@ 2
Umber, Raw, Amer.	1½@ 2
Yellow, Chrome	11 @14
Vermilion, American Lead	10 @25
Vermilion, Quicksilver, bulk	@65
Vermilion, Quicksilver, bags	@68
Vermilion, English, Import	75 @80
Vermilion, Chinese	$0.90@1.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1905, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Domestic, ₩ doz. $3.00.....33⅓%
North's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition— See *Caps, Cartridges, Shells, &c.*

Anvils—American—

Eagle Anvils.....₩ lb 6¾@7 ¢
Hay-Budden, Wrought.....9@9¾ ¢
Horseshoe brand, Wrought.....9@9¾ ¢
Trenton .....₩ lb 9@9¾ ¢

Imported—

Peter Wright & Sons.....₩ lb 10¾ ¢

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....15&10%

Apple Parers— See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co.....33⅓%

Augers and Bits—

Com. Double Spur.....75@75&5%
Jennings' Patn., reg. finish.....50&10@60%
Black Lip or Blued.....60&10%
Boring Mach. Augers.....70&10%
Car Bits, 12-in. twist.....50&10%
Ford's Auger and Car Bits.....40&5%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list..25%
No. 30, R. Jennings' list.....40&7½%
Russell Jennings'.....25&10&2½%
L'Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....45%
Millers Falls.....50&5&2½%
Ohio Tool Co.'s Bailey Auger and Car Bits.....40&10%
Pugh's Black.....20%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist....60&10%
Wright's Jennings' Bits.....50%

Bit Stock Drills— See *Drills, Twist.*

Expansive Bits—

Clark's small, $18; large, $26....50&10%
Clark's Pattern, No. 1, ₩ doz. $26; No. 2, $18.....65%
Ford's, Clark's Pattern.....60&5%
C. E. Jennings & Co., Steer's Pat..25%
Swan's 60%

Gimlet Bits—

Per gro.
Common Dble. Cut....$3.00@3.25
German Pattern, Nos. 1 to 10, $4.60; 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz..$5.50@6.00
Ames .....2&10%
Universal 20%
Wood's Universal.....25%

Ship Augers and Bits—

Ship Augers.....45&5@60%
Ford's .....33⅓@5%
C. E. Jennings & Co.:
L'Hommedieu's 15%
Watrous' .....35&5%
Ohio Tool Co.'s.....40%
Snell's 40%

Awl Hafts— See *Hafts, Awl.*

Awls—

Brad Awls:
Handled .....gro. $2.75@3.00
Unhdled, Shldered...gro.63@65¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. 31@34¢
Unhdled, Shldered..gro. 63@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Socket..gro.$11.50@12.00
Hurwood 40%

Awl and Tool Sets— See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights:
First Quality.....$8.75
Second Quality.....$8.25
Double Bit, base weights:
First Quality.....$9.00
Second Quality.....$8.50

Axle Grease— See *Grease, Axle*

Axles— *Iron or Steel*

Concord, Loose Collar...1¼@1¾¢
Concord, Solid Collar...1¾@5¼¢
No. 1 Common, Loose...3¼@3¾¢
No. 1½ Com., New Style3¾@4¼¢
No. 2 Solid Collar.....4@4½¢
Half Patent:
Nos. 7, 8, 11 and 12....75@75&5%
Nos. 13 to 14.....70&10@75&5%
Nos. 15 to 18...75&10@75&10&5%
Nos. 19 to 22...75&10@75&10&5%

Boxes, Axle—

Common and Concord, not turned lb..4½@5¢
Common and Concord, turned, lb., 5½@6¢
Half Patent.....lb. 8½@9¢

Bait— Fishing—

Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances— Sash—

Caldwell new list.....50%
Pullman .....50&10@60%

Spring—

Spring Balances.....50&10@60%
Chatillon's:
Light Spg. Balances.....40&10%
Straight Balances.....40%
Circular Balances.....50%
Large Dial.....30%

Barb Wire— See *Wire, Barb.*

Bars— Crow—

Steel Crowbars, 10 to 40 lb.... per lb., 2¾@3¢

Towel -

No. 10 Ideal, Nickel Plate..₩ gro. $8.50

Beams, Scale—

Scale Beams.....40&10@50%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ₩ doz. $0.85; Tinned $1.00
No. 11 Wire Coppered ₩ doz. $1.10; Tinned $1.20
No. 10 Wire Galvanized..₩ doz. $1.75
Western W. G. Co.:
No. 1 Electric.....₩ gro. $7.80
No. 2 Buffalo.....₩ gro. $3.00
No. 3 Perfection Dust.....₩ gro. $3.00

Egg—

Holt-Lyon Co.:
Holt, No. A, Japanned....₩ doz. $1.20
Holt, No. 1, Tinned.....₩ doz. $1.50
Holt, No. B, Japanned....₩ doz. $2.00
Holt, No. 2, Tinned.....₩ doz. $2.25
Lyon, No. 2, Japanned....₩ doz. $1.25
Lyon, No. 3, Japanned....₩ doz. $1.50
Taplin Mfg. Co.: ₩ gro.
No. 60 Improved Dover.....$6.00
No. 75 Improved Dover.....$6.50
No. 100 Improved Dover.....$7.00
No. 102 Improved Dover, Tin'd..$8.50
No. 150 Improved Dover, Hotel..$15.00
No. 152 Imp'd Dover, Hotel, T'd..$17.00
No. 200 Imp'd Dover Tumbler...$8.50
No. 202 Imp'd Dover Tumbler, T'd.$9.50
No. 300 Imp'd Dover Mammoth, ₩ doz. $25.00
Western, W. G. Co., Buffalo.....$7.00
Wonder (S. S. & Co.).₩ gro. net, $6.00

Bellows—

Blacksmith, Standard List.. 60&10@70&10%

Hand—

Inch..	*6*	*7*	*8*	*9*	*10*
Doz...	*$4.75*	*5.70*	*6.65*	*7.60*	*8.55*

Molders—

Inch..	*9*	*10*	*11*	*12*	*14*
Doz...	*$8.00*	*9.00*	*10.50*	*12.50*	*14.50*

Net Prices.

Bells— Cow—

Ordinary goods...75&5@75&10&5%
High grade.....70&10@70&10&5%
Jersey .....75&10%
Texas Star.....50%

Door—

Abbe's Gong.....45%
Burton Gong.....50%
Home, R. & E. Mfg. Co.'s.....55&10%
Lever and Pull, Sargent's....60&10&10%
Trip Gong.....50&10@50&10&5%
Yankee Gong.....55%

Hand—

Hand Bells, Polished, Brass.. 60&5@60&10%
White Metal.....60%
Nickel Plated....50&10@50&10&5%
Swiss .....60@60&7½%
Cone's Globe Hand Bells.....33⅓@35%
Silver Chime.....33⅓@35%

Miscellaneous—

Farm Bells.....lb. 2¼¢
Steel Alloy Church and School 50&10&5@60&5%
American Tube & Stamping Co. Gongs 75%
Table Call Bells.....50@50&10%

Belting— Leather—

Extra Heavy, Short Lap..60&5%
Regular Short Lap....60&10&5%
Standard 70%
Light Standard.....70&5%
Cut Leather Lacing.....60%
Leather Lacing Sides, per sq. ft. 22¢

Rubber—

Agricultural (Low Grade).... 75@75&5%
Common Standard....70@70&10%
Standard .....60&5@60&10%
Extra .....60@60&5%
High Grade.....50&5@50&10%

Bench Stops— See *Stops, Bench*

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender.....40%
Green River Tire Benders and Upsetters 20%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $4.25; No. 2, $7.25; No. 3, $10.50; No. 4, $16.25; No. 5, $20.50.

Bicycle Goods—

John S. Leng's Son's 1902 list:
Chain 50%
Parts 50%
Spokes 50%
Tubes 50%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks— Tackle—

Common Wooden....70&10@75%
Hartz St. Tackle Blocks.....50@50&5%
Hollow Steel Blocks, with Ford's Patent Sheaves.....50&10%
Lane's Patent Automatic Lock and Junior 30%
Stowell's Novelty, Mal. Iron....50&10%
Stowell's Self Loading.....60%
See also Machines, Hoisting.

Boards, Stove—

Zinc, Crystal, &c...30&10@40&10%

Boards, Wash—

See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co.....33⅓%

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread): ⅜ x 6 and smaller.....75@—%
Larger and Longer..65&5@—%
Phila. Eagle $3.00 list May 24, '99 80%
Bolt Ends, list Feb. 14, '95.... 65&10@—%
Machine, ⅜ x 4 and smaller 75@—%
Machine, larger and longer.. 65&10@—%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob:

Inch.....	*3*	*4*	*5*	*6*	*8*
Per doz.	*$0.30*	*.35*	*.45*	*.60*	*.80*

Cast Iron Spring Foot, Jap'd:

Inch.....	*6*	*8*	*10*
Per doz.....	*$1.20*	*1.50*	*2.25*

Cast Iron Chain, Flat, Japanned:

Inch.....	*6*	*8*	*10*
Per doz.....	*$1.00*	*1.40*	*1.65*

Cast Iron Flat Shutter, Jap'd., Brass Knobs:

Inch.....	*6*	*8*	*10*
Per doz.....	*$0.75*	*.95*	*1.25*

Wrt Barrel Japd.....80@80&10%
Wrt " Bronzed....50@50&10%
Wrt. Spring...70&10@70&10&10%
Wrt. Shutter.....50&5@50&10&5%
Wrt. Square Neck.....75@75&10%
Wrt Square 66⅔&10@66⅔&10&10%
Ives' Patent Door.....60%

Plow and Stove—

Plow .....65&10&10@70%
Stove .....85@87½%

Tire—

Common .....80&10&5%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84...82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Eclipse, list Dec. 28, '99.....80%
Mount Carmel Bolt Co.:
Norway Phila., list Oct. 16, '84....80%
Eagle Phila., list Oct. 16, '84....82½%
Mount Carmel, list Dec. 28, '99...80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct., '84.....80%
Upson Nut Co.:
Tire Bolts.....72½%

Borers, Tap—

Borers Tap, Ring, with Handle:

Inch.....	*1¼*	*1½*	*1¾*	*2*
Per doz...	*$4.80*	*5.60*	*6.40*	*8.00*
Inch	*2¼*	*2½*		
Per doz.....	*$6.65*	*11.50*		

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65; No. 3, $2.50 each.....25%

Boxes, Mitre—

C. E. Jennings & Co.....30%
Langdon .....15&10%
Perfection 40%
Seavey 33⅓%
Stanley R. & L. Co.:
Nos. 240 to 460.....30%
Nos. 50 and 60.....35%

Braces—

Common Ball, American..$1.25@1.30
Barber's .....50&10&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 .....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces.....25&10%
P., S. & W. Co., Peck's Pat.60@60&5%
Stanley R. & L. Co.:
Stanley 35%
Victor 45%

Brackets—

Wrought Steel...80&10@80&10&5%
Griffin's Pressed Steel.....60@60&10%
Griffin's Folding Brackets.....70&10%
Stowell's Cast Shelf.....75%
Stowell's Sink.....50%
Western, W. G. Co., Wire.....60&10%

Bright Wire Goods— See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co.....75&20%
Western, W. G. Co.....80%
Wire Goods Co.....75@75&10%

Buckets, Galvanized—

Price per dozen.

Quart.....	*10*	*12*	*14*
Water, Regular...	*1.40*	*1.70*	*1.90*
Water, Heavy....	*3.40*	*3.70*	*3.80*
Fire, Rd. Bottom..	*2.30*	*2.55*	*2.95*
Well	*2.55*	*2.87*	*3.15*

Bucks, Saw—

Hoosier.....₩ gro. $36.00

Bull Rings— See *Rings, Bull*

Butts— Brass—

Wrought, list Sept., '96....20&5%
Cast Brass, Tiebout's.....50%

Cast Iron—

Fast Joint, Broad....40&10&10%
Fast Joint, Narrow....40&10&10%
Loose Joint.....70&10&10%
Loose Pin.....70&10&10%
Mayer's Hinges.....70&10&5
Parliament Butts.....70@70&5

Wrought Steel—

Table and Back Flaps...75%
Narrow and Broad.....75%
Inside Blind.....75%
Loose Pin.....75%
Loose Pin, Jap'd.....70&10%
Loose Pin, Ball and Steeple Tip 85%
Japanned Ball Tip Butts... 70&10%
Bronzed, Wrt., Nar. and Inside Blind Butts....55&10%

Ex. 10&10&10@10&10&10&10&5%

Cages, Bird—

Hendryx, Brass:
3000, 5000, 1100 series.....5%
1200 series.....33⅓%
200, 300, 600 and 900 series.....40&10%

Hendryx Bronze:
700, 800 series....40&10%
Hendryx Enameled....40&10%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong....per lb.4¢1¼¢
Sharp, 1 prong...per lb., 4½@4¾¢
Gautier, Blunt....4@4¼¢
Gautier, Sharp....4½@4¾¢
Perkins', Blunt Toe....₰ lb 3.65¢
Perkins', Sharp Toe....₰ lb 4.15¢

Can Openers—

See *Openers, Can.*

Cans, Milk—

	5	8	10 gal.
Illinois Pattern	$1.35	1.85	2.35 each.
New York Pattern	1.50	2.20	2.45 each.
Baltimore Pattern	1.50	2.20	2.45 each.
Dubuque	1.35	1.60	1.75 each.

Cans, Oil—

Buffalo Family Oil Cans:

3	5	10 gal.
$18.00	60.00	129.60 gro., net.

Caps, Percussion—

Eley's E. B....52@55¢
G. D....per M 34@35¢
F. L....per M 40@42¢
G. E....per M 48@50¢
Musket....per M 62@63¢

Primers—

Berdan Primers, $2 per M...20%
B. L. Caps (Sturtevant Shells) $2 per M....20%
All other primers per M.$1.52@1.60

Cartridges—

Blank Cartridges:
32 C. F., $5.50....10&5%
38 C. F., $7.00....10&5%
22 cal. Rim, $1.50....10&5%
32 cal. Rim, $2.75....10&5%
B. B. Caps, Con. Ball, Swgd.$1.90
B. B. Caps, Round Ball....$1.49
Central Fire....25%
Target and Sporting Rifle..15&5%
Primed Shells and Bullets.15&10%
Rim Fire, Sporting....50%
Rim Fire, Military....15&5%

Casters—

Bed....70@70&10%
Plate....60&10@60&10&5%
Philadelphia....75@75&10%
Acme, Ball Bearing....33⅓%
Boss....70&10%
Boss Anti-Friction....70&10%
Gem (Roller Bearing)....80%
Martin's Patent (Phoenix)....45%
Standard Ball Bearing....45%
Tucker's Patent low list....30%
Yale (Double Wheel) low list....50%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Coil—

American Coil, Straight Link: See Trade Report.
German Coil....60&10&10@70%

Halter—

Halter Chains...60&10@60&10&10%
German Pattern Halter Chains, list July 24, '97....60&10&10%
Covert Mfg. Co.
Halter....35&5%
Covert's Saddlery Works
Halter....70%

Cow Ties—

See *Halters and Ties.*

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6½—6-3, Str'ght, with ring..$23.50
6½—6-2, Str'ght, with ring..$24.50
6½—8-2, Str'ght, with ring..$28.00
6½—10-2, Str'ght, with ring..$32.00
NOTE.—Add 2c per pair for Hooks. Twist Traces 2c per pair higher than Straight Link.
Trace, Wagon and Fancy Chains....60&5@60&10&5%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron....60&10&5@70%
Brass....60&10@60&10&10%
Safety Chain....75@75&10%
Gal. Pump Chain....lb. 5@5¼%
Covert Mfg. Co.:
Breast....35&5%
Heel....35&5%
Rein....35&5%
Stallion....35&5%
Covert Sad. Works:
Breast....70%
Hold Back....70%
Rein....70%
Oneida Community:
Am. Dog Leads and Kennel Chains. 40@40&5%
Niagara Dog Leads and Kennel Chains....45@60&5%
Wire Goods Co.:
Dog Chain....70&10%
Universal Dbl.-Jointed Chain....50%

Chain and Ribbon, Sash—

Oneida Community:
Copper Chain....60&5%
Steel Chain....60%
Pullman:
Bronze Chain....60%
Steel Chain....60&10%
Sash Chain Attachments, per set..8¢
Aluminoy Sash Ribbon, per 100 ft....$1.25@$3.00
Sash Ribbon Attachments, per set.8¢

Chalk—(From Jobbers.)

Carpenters' Blue....gro. .38@40¢
Carpenters' Red....gro. .33@35¢
Carpenters' White....gro. .28@30¢
See also Crayons.

Checks, Door—

Bardsley's....45%
Eclipse....60&10%
Pullman, per gro....$54.00
Russwin....40%

Chests, Tool—

American Tool Chest Co.:
Boy's Chests, with Tools....55%
Youths' Chests, with Tools....40%
Gentlemen's Chests, with Tools..30%
Farmers', Carpenters', etc., Chests, with Tools....20%
Machinists' and Pipe Fitters' Chests, Empty....50%
Tool Cabinets....50%
C. E. Jennings & Co.'s Machinists' Tool Chests....33⅓&10%

Chisels—

Socket Framing and Firmer
Standard List....75@75&10%
Buck Bros....30%
Charles Buck....30%
C. E. Jennings & Co. Socket Firmer No. 10....60%
C. E. Jennings & Co. Socket Framing No. 15....60%
Ohio Tool Co.'s....70%
Swan's....75%
L. & I. J. White....30@30&5%

Tanged—
Tanged Firmers....33 1-3@40%
Buck Bros....30%
Charles Buck....30%
C. E. Jennings & Co. Nos. 191, 181..25%
L. & I. J. White, Tanged....25&5%

Cold— *lb.*
Cold Chisels, good quality..13@15¢
Cold Chisels, fair quality..11@12¢
Cold Chisels, ordinary...9@10¢

Chucks—

Beach Pat., each $8.00....35&5%
Empire....25%
Blacksmiths'....25%
Jacobs' Drill Chucks....35%
Pratt's Positive Drive....25%
Skinner Patent Chucks:
Independent Lathe Chucks....50%
Universal....50%
Combination....50%
Drill Chucks, New Model....30%
Drill Chucks, Standard....45%
Drill Chuck, Skinner Pat., all sizes.35%
Drill Chucks, Positive Drive....30%
Planer Chucks....25%
Face Plate Jaws....40%
Standard Tool Co.:
Improved Drill Chuck....45%
Union Mfg. Co.:
Combination....50%
Czar Drill....35%
Combination Geared Scroll....40%
Geared Scroll....40%
Independent....50%
Independent Steel....40%
Union Drill....45%
Universal....50%
Independent Iron F. Plate Jaws.40%
Independent Steel F. Plate Jaws.40%
Westcott Patent Chucks:
Lathe Chucks....50%
Little Giant Auxiliary Drill....50%
Little Giant Double Grip Drill..50%
Little Giant Drill, Improved....50%
Oneida Drill....50%
Scroll Combination Lathe....50%

Clamps—

Adjustable, Hammers'....20@20&5%
Cabinet, Sargent's....50&10%
Carriage Makers', P., S. & W. Co....40&10@50%
Carriage Makers', Sargent's....60%
Besly, Parallel....33⅓&10%
Lineman's, Utica Drop Forge & Tool Co....40%
Saw Clamps, see Vises, Saw Filers'.
Wood Workers, Hammers'....40&10%

Cleaners, Drain—

Iwan's Champion, Adjustable....55%
Iwan's Champion, Stationary....45%

Sidewalk—

Star Socket, All Steel..₰ doz. $4.05 net
Star Shank, All Steel..₰ doz. $3.24 net
W. & C. Shank, All Steel, ₰ doz., 7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros....30%
New Haven Edge Tool Co.'s....45%
Fayette R. Plumb....33⅓@33⅓&10%
L. & I. J. White....30%

Clippers—

Chicago Flexible Shaft Company:
'98 Chicago Horse....$8.75 } 15%
1902 Chicago Horse....10.75 }
20th Century Horse, each, $5.00....20%
Lightning Belt....$15.00 } 15%
Chicago Belt....$20.00 }
Stewart's Patent Sheep, $12.75....20%

Clips, Axle—

Eagle, 5-16 and ⅜ in..75@75&10%
Norway, 5-16 and ⅜ in..60&10@70%

Cloth and Netting, Wire—See *Wire, &c.*

Cocks, Brass—

Hardware list: Compression, Plain Bibbs, Globe, Kerosene, Racking, &c., Cocks....75@75&5%

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list....40%
Leather, Walter B. Stevens & Son's list....40%

Combs, Curry—

Metal Stamping Co....40%

Mane and Tail—

Covert's Saddlery Works....60&10%

Compasses, Dividers, &c.

Ordinary Goods....75&5@75&10%
Bemis & Call Hdw. & Tool Co.:
Dividers....65%
Calipers, Double....65%
Calipers, Inside or Outside....65%
Calipers, Wing....60%
Compasses....50%

Conductor Pipe,—

L. C. L. to Dealers: Galvanized.

Territory.	*Nested.*	*Not nested.*
Eastern	*.70&15%*	*70&10%*
Central	*.70&7½%*	*70&2½%*
Southern	*.70&2½%*	*60&20%*
So. Western	*..60&20%*	*60&10%*

Copper. 1¼&16 oz.
Eastern....50&10%
Central....50&7½%
Southern....50&5%
So. Western....50&2½%
Terms, 60 days; 2% cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

Gal, each	2	3	4	6	8
Labrador	$1.20	$1.50	$1.80	$2.10	$2.70
Gal	3	4	6	8	
Iceland, ea.	$1.80	$2.10	$2.40	$3.00	
Gal	2	3	4	6	8
Galvanized, ea.	$1.85	$2.00	$2.25	$2.90	$3.90

Galvanized, Lined, side handles.

Gal,	2	3	4	6	8
Each	$1.95	$2.15	$2.40	$3.30	$1.15

White Enameled....25%
Agate Lined....25%

Coopers' Tools—

See *Tools, Coopers'.*

Coppers' Soldering—

Soldering Coppers, 3 lbs. to pair and heavier, 20½@21½¢; lighter than 3 lbs. to pair.22½@23½¢

Cord— Sash—

Braided, Drab....lb. 35¢
Braided, White, Com., Nos. 8 to 12, 23¢; No. 7, 23½¢; No. 6, 24½¢.
Cable Laid Italian....lb., A, 18¢; B, 16¢
Common India....lb. 10@10½¢
Cotton Sash Cord, Tw'ted..17@19¢
Patent Russia....lb...@14¢
Cable Laid Russia...lb...@15¢
India Hemp, Braided..lb...@18¢
India Hemp, Twisted..lb. 12@13¢
Patent India, Twisted..lb. 12@13¢
Anniston Cordage Co.: Braided Cotton, Old Glory, Nos. 7 to 12....₰ lb 29¢
Anniston, Nos. 8 to 12, 23¢; No. 7, 23½¢; No. 6, 24½¢; Anniston Drab, Nos. 7 to 12, ₰ lb, 26¢; Anniston Mahogany, 27¢.
Pearl Braided, cotton, No. 6, ₰ lb, 24½¢; No. 7, 23½¢; Nos. 8 to 12, 23¢
Eddystone Braided, Nos. 8, 9 and 10, 25¢; 7, 25½¢; 6, 26½¢.
Harmony Cable Laid Italian, Nos. 7 to 10....₰ lb 23 ¢
Peerless:
Cable Laid Italian....16 ¢
Cable Laid Russian....14 ¢
Cable Laid India....12 ¢
Braided India....18 ¢
Pullman:
Wire Sash Cord....10%
Sash Cord Attachments, per doz.10¢
Samson, Nos. 8 to 12:
Braided, Drab Cotton....₰ lb 40 ¢
Braided, Italian Hamp....₰ lb 40 ¢
Braided, Linen....₰ lb 55 ¢
Braided, White Cotton or Spot....₰ lb 35 ¢
Massachusetts, White....₰ lb 28 ¢
Massachusetts, Drab....₰ lb 32 ¢
Phoenix, White, Nos. 8 to 12, 24¢; No. 7, 24½¢; No. 6, 25½¢.
Silver Lake:
A quality, Drab....40 ¢
A quality, White....35 ¢
B quality, Drab....35 ¢
B quality, White....30 ¢
Italian Hemp....40 ¢
Linen....57½ ¢
See also Chain and Ribbon.

Wire, Picture—

List Oct., '00....85&10&10@85&10&10&5%
Hendryx Standard Wire Picture Cord, 85&10&5%

Cradles—

Grain....40&12½%

Crayons—

White Round Crayons, gr..6@6½¢
Cases, 100 gro., $5.00 at factory.
D. M. Steward Mfg. Co.:
Jumbo Crayons....gr. $3.50 } Case lots, 20%
Metal Workers' Crayons, gr. $2.50 }
Soapstone Pencils, round, flat or square....gr. $1.50 }
Rolling Mill Crayons....gr. $2.50 }
Railroad Crayons (composition) gr. $2.00 }
Zelnicker's Lumber:
Red, Blue, Green....₰ gro. $6.50
Black....₰ gro. $4.00
See also Chalk.

Crooks, Shepherds'—

Fort Madison, Heavy....₰ doz. $7.00
Fort Madison, Light....₰ doz. $6.50

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden....50%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847..₰ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor....₰ doz. $3.00
Wm. Rogers & Son....₰ doz. $2.50

Cutters— Glass—

H. H. Mayhew Co....40%
Red Devil....50%
Smith & Hemenway Co....50%
Woodward....40%

Meat and Food—

American....30%

Nos.	1	2	3	4	B	5
Each	$5	$7	$10	$25	$50	$60

Enterprise....25@25&7½%

Nos.	5	10	12	22	32
Each	$2	$3	$2.75	$4.50	$6

Dixon's....₰ doz. 40@50%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Ideal....40&10@50%
Little Giant....₰ doz. 40@50%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$68.00

N. E. Food Choppers....25%
New Triumph No. 605, ₰ doz. $24.00....40@50%
Russwin Food, No. 1, $24.00; No. 2, $27.00....45&10&10%
Woodruff's....₰ doz. 40@50%

Nos.	100	150
	$15.00	$18.00

Enterprise Beef Shavers....25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw, Corn Grater, &c....40%
Kraut Cutters, 24 x 7, 26 x 8, 30 x 9....
Kraut Cutters, 36 x 12, 40 x 12....
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....₰ doz. $3.00
Combined Slaw Cutter and Corn Grater....₰ doz. $4.00
Tucker & Dorsey Mfg. Co.:
Kraut Cutters....
Slaw Cutters, 1 Knife..₰ gr. $18@$30
Slaw Cutters, 2 Knife..₰ gr. $22@$36

Tobacco—

All Iron, Cheap..doz. $4.25@$4.70
Enterprise....25@30%
National, ₰ doz., No. 1, $21; No. 2, $18....40%
Sargent's, ₰ doz., No. 2....60%
Sargent's, Nos. 12 and 21....60&10%

Washer—

Appleton's, ₰ doz., $16.00....50&10&10%

Diggers, Post Hole, &c.—

Dalbey Post Hole Auger..per doz. $9.00
Iwan's Imp'ved Post Hole Auger.40&5%
Iwan's Vaughan Pattern Post Hole Augers....₰ doz. $6.25
Iwan's Perfection Post Hole Digger....₰ doz. $8.25
Iwan's Split Handle Post Hole Diggers....₰ doz. $7.25
Kohler's Universal....₰ doz. $14.00
Kohler's Little Giant....₰ doz. $12.00
Kohler's Hercules....₰ doz. $10.00
Kohler's Invincible....₰ doz. $9.00
Kohler's Rival....₰ doz. $8.00
Kohler's Pioneer....₰ doz. $7.00
Never-Break Post Hole Diggers, ₰ doz., $24.00....60%
Samson, ₰ doz. $34.00....25%

Dividers—See *Compasses.*

Doors, Screen—

Phillips', style E, ⅞ in....₰ doz. $10.00
Phillips', style 077, ⅞ in....₰ doz. $7.50
Phillips', style x-y, ⅞ in....₰ doz. $10.50

Drawers, Money—

Tucker's Pat. Alarm Till No. 1, ₰ doz., $18; No. 2, $15; No. 3, $12; No. 4, $18.

Drawing Knives—

See *Knives, Drawing.*

Dressers, Emery Wheel—

Diamond Emery Wheel Dressers....35%
Diamond Wheel Dresser Cutters....35%

Drills and Drill Stocks—

Common Blacksmiths' Drill, each....$1.50@$1.75
Breast, Millers Falls....15&10%
Breast, P., S. & W....40%
Goodell Automatic Drills..40&5@40&10%
Johnson's Automatic Drills, Nos. 2 and 3....16⅔%
Johnson's Drill Points....16⅔%
Millers Falls Automatic Drills.33⅓&10%
Ratchet, Curtis & Curtis....25%
Ratchet, Parker's....40%
Ratchet, Weston's....40%
Ratchet, Weston's, Style H Improved....40%
Ratchet, No. 012....40%
Ratchet, Whitney's, P., S. & W..50%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00....33⅓%

Twist Drills—

Bit Stock....60&10&10@70%
Taper and Straight Shank....60&10@60&10&5%

Drivers, Screw—

Screw D'ver Bits, per doz..45@60¢
Balsey's Screw Holder and Driver, ₰ doz., 2½-in., $6; 4-in., $7.50; 6-in., $9....50%
Buck Bros.' Screw Driver Bits....30%
Champion....50%
Edson....60%
Fray's Hol. H'dle Sets, No. 3, $12..50%
Gay's Double Action Ratchet....35%
Goodell's Auto..50&10&10@50&10&10&5%
Hurwood....40%
Mayhew's Black Handle....40%
Mayhew's Monarch....40&10%
Millers Falls, Nos. 20 and 21....25&10%
Millers Falls, Nos. 11, 12, 41, 42..15&10%
New England Specialty Co....50&10%
Sargent & Co.'s:
Nos. 1 and 60....50&10&10%
Nos. 50, 53 and 55....60&10%
Nos. 20 and 40....70&10%
Smith & Hemenway Co....40&5%
H. D. Smith & Co.'s Perfect H'dle.40%
Stanley R. & L. Co.'s:
No. 64, Varn. Handles....65%
No. 86....75%
Victor....55%
Defiance....70%
Swan's:
Nos. 7565 to 7568....50%
No. 7540....40&10%

Eave Trough, Galvanized—

Territory.	*L. C. L.*
Eastern	*.80&5%*
Central	*.75&10&10*
Southern	*.75&12½%*
So. Western	*.75&5%*

Terms.—2% for cash. Factory shipments generally delivered.
See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories:
Galv. Steel and Galv. C. C. Iron and Steel, Standard Gauge....60&10%
No. 26....35%
No. 24....25%
No. 22....10%
Copper....37½%
Perfect Elbows (S., S. & Co.)....40%

Emery, Turkish—

4to4½ 5 to 180 Flour

Kegs	*lb. 5 ¢*	*5¼¢*	*5¼¢*
½ Kegs	*lb. 5¼¢*	*5¾¢*	*5¾¢*
¼ Kegs	*lb. 5½¢*	*6 ¢*	*4 ¢*
10-lb. cans, 10 in case		*6½¢ 7 ¢*	*6 ¢*
10-lb. cans, less than 10		*10 ¢ 10 ¢*	*8 ¢*
Less quantity		*10 ¢ 10 ¢*	*8 ¢*

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice—See *Squeezers, Lemon.*

Fasteners, Blind—
Zimmerman's .....50&10%
Walling's .....40&10%

Cord and Weight—
Ives 40%

Faucets—
Cork Lined.....50@50&10%
Metallic Key, Leather Lined.. 60&10@70%
Red Cedar.....40&10@50%
Petroleum.....70&10@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star 60%
West Lock.....50&10%
John Sommer's Peerless Tin Key....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Mtl. Key.50&10%
John Sommer's Duplex Metal Key..60%
John Sommer's Diamond Lock.....40%
John Sommer's I.X.L. Cork Lined...50%
John Sommer's Reliable Cork Lined.. 50&10%
John Sommer's Chicago Cork Lined.60%
John Sommer's O. K. Cork Lined...50%
John Sommer's No Brand, Cedar....50%
John Sommer's Perfection, Cedar....40%
McKenna, Brass:
Burglar Proof, N. P.....25%
Improved, ¾ and ⅞ inch.....25%
Self Measuring:
Enterprise, ℔ doz. $36.00.....40&10%
Lane's, ℔ doz. $36.00.....40&10%
National Measuring, ℔ doz. $36.40&10%

Felloe Plates—
See *Plates, Felloe.*

Files— Domestic—
List revised Nov. 1, 1899.
Best Brands.....70&10@75&5%
Standard Brands.75&10@75&10&10%
Lower Grade....75&10&10@80&10%

Imported—
Stubs' Tapers, Stubs' list, July 24, '97.....33 1-3@40%

Fixtures, Fire Door—
Richards Mfg. Co.:
Universal, No. 103.....$3.75
Special, No. 104.....$3.75
Fusible Links, No. 96.....50%
Expansion Bolts, No. 107.....60&10%

Grindstone—
Net Prices:

Inch	*15*	*17*	*19*	*21*
Per doz	*$3.25*	*3.75*	*4.25*	*4.75*

P., S. & W. Co.....30&10@40%
Reading Hardware Co.....60%
Sargent's 70%
Stowell's Giant Grindstone Hanger.. ℔ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy .....50&10&10%
Stowell's Grindstone Fixtures, Light. 60&10%

Fodder Squeezers—
See *Compressors.*

Forks—
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Iowa Dig-Ezy Potato.....60&10%
Victor, Hay.....60&15&2½%
Victor, Manure.....60%
Victor, Header.....60%
Champion, Hay.....60%
Champion, Header.....60%
Champion, Manure.....60&15&2½%
Columbia, Hay.....60&20%
Columbia, Manure.....70%
Columbia, Spading.....70&12½%
Hawkeye Wood Barley.....40%
W. & C. Potato Digger.....60&10%
Acme Hay.....60&20%
Acme Manure, 4 tine.....60&10&5%
Dakota Header.....60&20%
Jackson Steel Barley.....60&20%
Kansas Header.....65%
W. & C. Favorite Wood Barley.....40%
Plated.—See Spoons.

Frames— Saw—
White, S'g't Bar, per doz.75@80¢
Red, S'g't Bar, per doz..$1.00@1.25
Red, Dbl. Brace, per doz.$1.40@1.50

Freezers, Ice Cream—

Qt.	*1*	*2*	*3*	*4*	*6*
Each	*$1.30*	*$1.60*	*$1.90*	*$2.20*	*$2.80*

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*
Hemp $2.75
Cotton 3.20
Waterproof Sgl. Taped..3.65
Waterproof Dbl. Taped..4.40
Waterproof Tpl. Taped..5.15
} 25% off list

Gates, Molasses and Oil—
Stebbins' Pattern.80&10@80&10&5%

Gauges—
Marking, Mortise, &c..50&10@60%
Chapin-Stephens Co.:
Marking, Mortise, &c.50&10@50&10&10%
Scholl's Patent.....50&10@50&10&10%
Door Hangers.....50@50&10%
Stanley R. & L. Co.'s Butt and Rabbet Gauge.....35%
Marking and Mortise.....60%
Wire, Brown & Sharpe's.....25%
Wire, Morse's.....25%
Wire, P., S. & W. Co.....25&4%

Gimlets— Single Cut—
Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.30
Spike, Metal, No. 1, $4.00; 2, $4.30
Nail, Wood Handled, No. 1, $2.30; 2, $2.60
Spike, Wood Handled, No. 1, $4.30; 2, $4.60

Glass, American Window
See *Trade Report.*

Glasses, Level—
Chapin-Stephens Co.....60@60&10&10%

Glue, Liquid Fish—
Bottles or Cans, with Brush.. 25@50%
Cans (½ pts., pts., qts., ½ gal., gal.).....25@48%
International Glue Co. (Martin's)..40%

Grease, Axle—
Common Grade....gro. $4.50@6.00
Dixon's Everlasting..10-lb pails, ea. 85¢
Dixon's Everlasting, in boxes, ℔ doz. 1 lb. $1.20; 2 lb. $2.00
Helmet Hard Oil.....25%

Grips, Nipple—
Perfect Nipple Grips.....40&10&2%

Griddles, Soapstone—
Pike Mfg. Co.....33⅓@33⅓&10%

Grindstones—
Bicycle Emery Grinder.....$6.50
Bicycle Grindstones, each.....$2.50@3.00
Pike Mfg. Co.:
Improved Family Grindstones, per inch, ℔ doz.....$2.00 } 33⅓%
Pike Mower and Tool Grinder, each .....$6.00 }
Velox Ball Bearing, Mounted, Angle Iron Frames, each.....$3.00

Halters and Ties—
Cow Ties.....60@60&10%
Covert Mfg. Co.:
Web .....35&5%
Jute Rope.....50%
Sisal Rope.....30&10%
Cotton Rope.....45%
Hemp Rope.....45%
Covert's Saddlery Works:
Web and Leather Halters.....70%
Jute and Manila Rope Halters....70%
Sisal Rope Halters.....60&20%
Jute, Manila and Cotton Rope Ties 70%
Sisal Rope Ties.....60&10%
Oneida Community:
Am. Coil and Halters.....40@40&5%
Am. Cow Ties.....45@50%
Niagara Coil and Halters..45@50&5%
Niagara Cow Ties....45&5@50&10&5%
E. T. Rugg & Co.:
Leather Halters.....50%
Web Halters and Webbing.....60%
Jute and Sisal Rope Halters.....60%
Jute and Sisal Horse and Cattle Ties 60%
Cotton Horse Ties.....60%
Livery Ties, Braided.....60%

Hammers—
Handled Hammers—
Heller's Machinists'...40&10@40&10&10%
Heller's Farriers.....40&10@40&10&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75.....50%
Peck, Stow & Wilcox, Steel.....50%
Fayette R. Plumb:
Plumb, A. E. Nail.....33⅓&7⅛@33⅓&10&7⅛%
Engineers' and R. S. Hand.....50&7½&5@50&10&7½&5%
Machinists' Hammers.50&5@50&10&5%
Riveting and Tinners'.....40&2½@40&10&2½%
Sargent's C. S. New List.....40%

Heavy Hammers and Sledges—
Under 3 lb., per lb., 50¢..85@85&10%
3 to 5 lb., per lb., 40¢..85@85&10%
Over 5 lb., per lb., 30¢, 85&10@85&10&10%
Wilkinson's Smiths'...lb. 9½@10¢

Handles—
Agricultural Tool Handles
Axe, Pick, &c.....60&5@60&10&5%
Hoe, Rake, &c.....45@50&5%
Fork, Shovel, Spade, &c.:
Long Handles.....45@50&5%
D Handles.....40%

Cross-Cut Saw Handles—
Atkins' 40%
Champion .....45@45&10%
Disston's 50%

Mechanics' Tool Handles—
Auger, assorted...gro. $2.50@3.00
Brad Awl.....gro. $1.65@$1.75
Chisel Handles:
Apple Tanged Firmer, gro. assorted .....$2.40@$2.65
Hickory Tanged Firmer, gro. assorted .....$2.15@$2.40
Apple Socket Firmer, gro. assorted .....$1.75@$1.95
Hickory Socket Firmer, gro. assorted .....$1.45@$1.60
Hickory Socket Framing, gro. assorted .....$1.60@$1.75
File, assorted.....gro. $1.30@$1.40
Hammer, Hatchet, &c. 60&10@60&10&10%
Hand Saw, Varnished, doz. 80&85¢; Not Varnished...65@75¢
Plane Handles:
Jack, doz. 30¢; Jack, Bolted.75¢
Fore, doz. 45¢; Fore, Bolted.90¢
Chapin-Stephens Co.:
Carving Tool.....40@40&10%
Chisel .....65@65&10%
File and Awl.....65@65&10%
Saw and Plane.....40@40&10%
Screw Driver.....40@40&10%
Millers Falls Adj. and Ratchet Auger Handles .....15&10%
Nicholson Simplicity File Handle.. ℔ gro. $0.85@$1.50

Hangers—
NOTE—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c
Allith Mfg. Co.:
Reliable, No. 1.....per doz. $2.00
Reliable, No. 2.....per doz. $3.00
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60&10%
Roller Bearing.....70%
Griffin Mfg. Co.:
Solid Axle, No. 19, $12.00.....70%
Roller Bearing, No. 11, $15.00.70%
Roller Bearing, Ex. Hy., No. 22, $18.00.....70%
Hinged Hangers, $16.00....60&10%
Lane Bros. Co.:
Parlor, Ball Bearing.....$4.00
Parlor, Standard.....$3.15
Parlor, No. 105.....$2.85
Parlor, New Model.....$2.80
Parlor, New Champion.....$2.25
Barn Door, Standard.....60&5%
Hinged.....net $6.10
Covered .....60&2%
Special .....70&5%
Lawrence Bros.:
Advance .....60&10%
Cleveland 75%
Clipper, No. 75.....60%
Crown .....60&10%
Easy Parlor Door, Dbl. Sets, $2.50; Single Sets, $1.25.
Giant .....60&5%
Hummer .....70&5%
New York.....60&10%
Peerless 75%
Sterling .....60&10%
McKinney Mfg. Co.:
No. 1, Special, $15.....60&10%
No. 2, Standard, $18.....60&10%
Hinged Hangers, $16.....50%
Meyers' Stayon Hangers.....60&5%
Richards Mfg. Co.:
Pioneer Wood Track No. 3..$2.00
Ball B'r'g St'l Track No. 10,5&10%
Roller B'r'g St'l Track No. 12.$2.15
Roller B'r'g St'l Track No. 13.$2.30
Hero, Adj. Track No. 19..50&10%
Adjustable Track Tandem Trolley Track No. 16.....50&10%
Seal, Steel Track No. 8.....$2.25
Auto Adj. Track No. 22..50&10%
Trolley B. D. No. 17.....$1.25
Trolley F. D. No. 120.....$2.10
Trolley F. D. No. 121.....$2.25
Trolley F. D. No. 150.....$2.35
Safety Underwriters F. D. No. 101 .....50%
Tandem No. 41..2½ and 3 60&10%
Palace, Adjustable Track No. 132 .....50&10%
Royal, Adjustable Track No. 122 .....50&10%
Ives' Wood Track No. 1.....$2.00
Trolley B. D. No. 20.....50&10%
Trolley B. D. No. 24.....$1.30
Trolley B. D. No. 27.....$1.40
Trolley B. D. No. 28.....$1.60
Roller Bearings Nos. 39, 41, 43 .....75%
Anti-friction No. 42.....60&20%
Hinged Tandem No. 48....60&5%
Folding Door B. B. Swivel No. 135 .....40%
Safety Door Hanger Co.:
Storm King Safety.....60%
U. S. Standard Hinge.....60%
Stowell Mfg. & Foundry Co.:
Acme Parlor Ball Bearing....40%
Ajax Hinge Door.....60%
Apex Parlor Door.....50&10&5%
Atlas 60%
Baggage Car Door.....50%
Climax Anti-Friction.....50&10%
Elevator 40%
Express 50%
Freight Car Door.....60%
Interstate .....60&10%
Lundy Parlor Door.....50&10%
Magic 60%
Matchless .....60&10%
Nansen .....70&5%
Parlor Door.....50&10%
Railroad .....50&10%
Rex Hinge Door.....60%
Street Car Door.....50%
Steel, Nos. 300, 404, 500....50&10%
Underwriters' Fire Door.....40%
Wild West Warehouse Door..50%
Zenith for Wood Track....50&10%
A. L. Sweet Iron Works:
Check Back.....70%
Climax Anti-Friction.....50&10%
Eagle 70%
Hylo Hinge.....60%
New Perfection.....60%
Pilot 60%
Pilot Hinge.....60%
Rider Wooster.....65%
Western Pattern.....70%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing.50&15&10&5%
Wilcox Mfg. Co.:
Bike Roller Bearing..℔ doz. $5.00
C. J. Roller Bearing.....60&10%
Cycle Ball Bearing.....50%
Dwarf Ball Bearing.....40%
Ives, Wood Track.....60&10%
L. T. Roller Bearing....60&10&5%
New Era Roller Bearing..50&10%
O. K. Roller Bearing..60&10&5%
Prindle, Wood Track.....60%
Richards' Wood Track.....60%
Richards' Steel Track.....50&10%
Spencer Roller Bearing....60&10%
Tandem, Nos. 1 and 2.....60%
Underwriters' Roller Bearing..40%
Velvet 50%
Wilcox Auditorium Ball B'r'g.20%
Wilcox Barn Trolley No. 123..40%
Wilcox Elv. Door, Nos. 112 and 122½.....50%
Wilcox Elv. Door No. 132....40%
Wilcox Fire Trolley, Roller Bearing.....30%
Wilcox Le Roy Noiseless Ball Bearing 40%
Wilcox New Century..50&10&10%
Wilcox O. K. Steel Track....50%
Wilcox O. K. Trolley.....50%
Wilcox Trolley Ball Bearing..40%
Wilcox Wideman Narrow Gauge Ball Bearing.....40%
For Track, see Rail.

Hangers— Garment—
Pullman Trouser, ℔ gro., 1 pair Flat Aluminoy, $9.00; 1 pair Round Nickeled, $9.00; 4 pair Round Nickeled.. $27.00
Victor Folding.....℔ gro. $9.00
Western, W. G. Co.....70&10%

Extra 10% often given.

Gate—
Myers' Patent Gate Hangers, ℔ doz. net $4.50

Joist and Timber—
Lane Bros. Co.....30%

Hasps—
Griffin's Security Hasp.....50%
McKinney's Perfect Hasp, ℔ doz..50%

Hatchets—
Regular list, first quality....50%
Second quality $1.00 per doz. less than first quality.

Heaters, Carriage—
Clark, No. 5, $1.75; No. 5B, $2.00; No. 3, $2.25; No. 3D, $2.75; No. 7D, $3.00; No. 3E, $3.25; No. 1, $3.50.....15%
Clark Coal, ℔ doz. $0.75.....10%

Hinges—
Blind and Shutter Hinges—
Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	*1*	*3*	*5*
Doz. pair	*$0.75*	*1.35*	*2.70*

Mortise Shutter: (L. & P., O. S., Dixie, &c.)

No.	*1*	*1½*	*2*	*2½*
Doz. pair	*$0.70*	*.65*	*.60*	*.55*

Mortise Reversible Shutter (Buffalo, &c.):

No.	*1*	*1½*	*2*
Doz. pair	*$0.70*	*.65*	*.60*

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Charles Parker Co.....70@75%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00.....20%
Reading's Gravity.....60%
Sargent's, Nos. 1, 3, 11 and 13..75&10%
Stanley's Steel Gravity Blind Hinges, ℔ doz. sets, without screws, $0.90; with screws, $1.20.
Wrightsville Hardware Co.:
O. S., Lull & Porter.....75&10&5%
Acme, Lull & Porter.....75&10%
Queen City Reversible.....75&10%
Shepard's Noiseless, Nos. 60, 65, 55 .....75&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&10&5%
1868, Old Pat'n, Nos. 1, 3 & 5.....75&10&5%
Tip Pat'n, Nos. 1, 3 & 5...75&10&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5.....75&10&5%
Shepard's Double Locking, Nos. 20 & 25.....70%
Champion Gravity Locking, No. 75.75%
Steamboat Gravity Locking, No. 10.75%
Pioneer, Nos. 060, 45 & 5½.....75%
Empire, Nos. 101 & 103.....70%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60%

Gate Hinges—
Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with L't'chs.	*$2.00*	*2.70*	*5.00*
Hinges only	*1.40*	*2.05*	*3.80*
Latches only	*.70*	*.70*	*.35*

New England:
With Latch.....doz. ...@$2.00
Without Latch...doz. ...@$1.60
Reversible Self-Closing:
With Latch.....doz. ...@$1.75
Without Latch...doz. ...@$1.35
Western:
With Latch.....doz. $1.75
Without Latch.....doz. $1.15
Wrightsville Hardware Co.:
Shepard's or Clark's, doz. sets,

Nos.	1	2	3
Hinges with Latches	$2.00	2.70	5.00
Hinges only	1.40	2.05	3.80
Latches only	.70	.70	1.35

Pivot Hinges—
Bommer Bros. Pivot.....40%
Lawson Mfg. Co. Matchless.....45%

Spring Hinges—
Holdback, Cast Iron.....$6.50
Non-Holdback, Cast Iron....$6.25
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges.....45%
Bardsley's Patent Checking..15%
Bommer Bros.:
Bommer Ball Bearing Floor Hinges 40%
Bommer Spring Hinges.....40%
No. 990 Wrot. Steel Hold Back, ℔ gr. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges....50%
Chicago (Ball Bearing) Floor Hinge 50%
Garden City Engine House....25%
Keene's Saloon Door.....25%
Columbian Hardware Co.:
Acme, Wrought Steel.....30%
Acme, Brass.....25%
American 30%
Columbia, No. 14.....℔ gr. $9.00
Columbia, No. 18.....℔ gr. $25.00
Columbia, Adjustable, No. 7, ℔ gr. $12.00
Gem, new list.....30%
Clover Leaf.....℔ gr. $12.00
Oxford, new list.....30%
Lawson Mfg. Co. Matchless....30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door.....℔ gr. $9.00
Ball Bearing Floor Hinge....50%
Ohio Detachable Screen Door Hinge .....℔ gr. $12.00
The Stover Mfg. Co.:
Ideal, No. 16, Detachable, ℔ gr. $12.50
Ideal, No. 4.....℔ gr. $9.00
New Idea, No. 1.....℔ gr. $9.00
New Idea, Double Acting....45%
New Idea, Floor.....45%
Van Wagoner:
Ball Bearing.....25%
No. 777 Sh't Steel Holdb'k, ℔ gro. pr. $9

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—

Strap and T Hinges, &c., list December 20, 1904:

Light Strap Hinges...70%
H'vy Strap H'g's...75&5%
Light T Hinges.....65%
Heavy T Hinges.....60%
Extra H'y T H'g's.70&10%
Hinge Hasps.....50%
Cor. Heavy Strap...75&5%
Cor. Ex. Heavy T.70&10%

Extra 10@10&5%

Screw Hook and Strap. { *6 to 12 in..lb. 3½¢* / *1½ to 20 in..lb. 3½¢* / *22 to 36 in..lb. 3 ¢*

Screw Hook and Eye:
¾ to 1 inch.....lb. 6 ¢
⅝-inch.....lb. 7 ¢
½-inch.....lb. 9 ¢

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers....35%

Hods— Coal—

	Per doz.			
Inch	*15*	*16*	*17*	*18*
Galv. Open	*$2.50*	*2.75*	*3.00*	*3.25*
Jap. Open	*$1.90*	*2.10*	*2.25*	*2.55*
Galv. Funnel	*$3.00*	*3.30*	*3.60*	*3.90*
Jap. Funnel	*$2.45*	*2.65*	*2.85*	*3.30*

Masons' Etc.—

Avery-Caldwell Mfg. Co.:
Steel Brick.....each $1.00
Steel Mortar.....each $1.25
Cleveland Wire Spring Co.:
Steel Brick, No. 162.....each $0.95
Steel Mortar, No. 158.....each $1.25

Hoes— Eye—

Scovil and Oval Pattern.....
60&10@60&10&10%
Grub, list Feb. 23, 1899.....
70&10@75&10%
D. & H. Scovil.....33⅓%

Handled—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Cronk's Weeding No. 1, $2.00; No. 2, $2.25
Ft. Madison Cotton Hoe...70&10&10%
Ft. Madison Crescent Cultivator Hoe, ℔ doz.....70&10%
Ft. Madison Mattock Hoes:
Regular Weight.....℔ doz. 66⅔%
Junior Size.....℔ doz. $4.00
Ft. Madison Sprouting Hoe...℔ doz. 50%
Ft. Madison Dixie Tobacco Hoe.....
75&10&7½%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....45&10%
W. & C. Ivanhoe.....75&2%
B. B. 6 in., Cultivator Hoe.....$3.15
B. B., 6½ in.....$3.35
Acme Wedding.....℔ doz., net, $4.35
W. & C. L'tning Shuffle Hoe, ℔ doz. $4.85

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Angular, ℔ doz. $24.00.....45&10%

Door—

Bardsley's.....45%
Empire.....50%
Pullman.....50%

File and Tool—

Nicholson File Holders and File Handles.....33⅓&40%

Fruit Jar—

Triumph Fruit Jar Holder, ℔ gross, $10.80; ℔ doz.....$1.25

Hones—Razor—

Pike Mfg. Co., Belgian, German and Swaty.....50%

Hooks—Cast Iron—

Bird Cage, Reading.....40%
Bird Cage, Sargent's List.....60&10%
Ceiling, Sargent's List, Nos. 29, 32, 33, 129, 132, 133 and 135.....50&10&10%
Clothes Line, Reading List.....40%
Clothes Line, Sargent's List.50&20&10%
Coat and Hat, Sargent's List...50&10%
Clothes Line, Stowell's.....70%
Coat and Hat, Reading.....45&20%
Coat and Hat, Stowell's.....70%
Coat and Hat, Wrightsville.....65%
Harness, Reading List.....40%
Harness, Stowell's.....60%
School House, Stowell's.....70%

Wire—

Belt.....80&10@..%
Wire C. & H. Hooks:.....
75&10@75&10&10%
Columbian Hdw Co., Gem.....70&10%
Parker Wire Goods Co., King..75&10%
Van Wagoner, Coat and Hat.....70%
Western W. G. Co. Molding.....75%
Wire Goods Co.:
Acme.....60&10%
Chief.....70%
Crown.....75%
Czar.....65%
V Brace.....75%
Czar Harness.....50&10%

Wrought Iron—

Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton.....doz. $1.05@$1.25
Wrought Staples, Hooks, &c.—
See Wrought Goods.

Miscellaneous—

Hooks, Bench, see *Stops, Bench.*
Bush, Light, doz. $4.75; Medium, $5.35; Heavy, $6.25
Grass, best, all sizes, per doz.$1.50
Grass, common grades, all sizes, per doz.....$1.30
Whiffletree.....lb. 5¼@6¢
Hooks and Eyes:
Brass.....60&10&5@60&10&10%
Malleable Iron..70&10@70&10&10%
Covert Mfg. Co. Gate and Scuttle Hooks.....35%
Covert Saddlery Works' Self Locking Gate and Door Hook.....60%
Ft. Madison Cut-Easy Corn Hooks, ℔ doz. $3.25 net
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾-inch:
Competition.....ft. 5 @ 6 ¢
3-ply Standard.....ft. 8 @ 9 ¢
4-ply Standard.....ft. 10 @11 ¢
3-ply extra.....ft. 11 @13 ¢
4-ply extra.....ft. 14 @16 ¢
Cotton Garden, ¾-in., coupled:
Low Grade.....ft. 8 @ 9 ¢
Fair Quality.....ft. 10 @11 ¢

Irons— Sad—

From ¼ to 10.....lb. 3¾@3 ¢
B. B. Sad Irons.....lb. 3¼@3½¢
Chinese Laundry.....lb. 4¾@5 ¢
Chinese Sad.....lb. ¼ @4¼¢
Mrs. Potts', cents per set:

Nos.	*50*	*55*	*60*	*65*
Jap'd Tops	*62*	*59*	*72*	*69*
Tin'd Tops	*65*	*62*	*75*	*72*

New England Pressing:lb. 3¾@4¢

Pinking—

Pinking Irons.....doz. 50@60¢

Irons, Soldering

See *Coppers.*

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw.....30&2%
Steel.....45%
Covert's Saddlery Works:
Daisy.....60&10%
Victor.....60%
Lockport.....50%
Lane's Steel.....30&10&2%
Richards' Tiger Steel, No. 130...50&10%
Smith & Hemenway Co.'s.....25%

Kettles—

Brass, Spun, Plain.....20@25%
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c.....30%
Wilkinson Shear & Cutlery Co.....50%

Corn—

Withington Acme, ℔ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List.....75@75&10%
C. E. Jennings & Co., Nos. 45, 46..60%
Jennings & Griffin, Nos. 41, 42.....60%
Ohio Tool Co.'s.....70%
Swan's.....75%
Watrous.....16⅔%
L. & I. J. White.....20&5@25%

Hay and Straw—

Serrated Edge..per doz.$5.25@5.50
Iwan's Sickle Edge.....℔ doz. $9.50
Iwan's Serrated.....℔ doz. $10.00

Mincing—

Buffalo.....℔ gro. $13.00

Miscellaneous—

Farriers'.....doz. $3.00@3.25
Wostenholm's.....℔ doz. $3.00@3.25

Knobs—

Base, 2½-inch, Birch, or Maple, Rubber tip.....gro.$1.15@1.20
Carriage, Jap., all sizes.....
gro. 40@45¢
Door, Mineral.....doz. 65@70¢
Door, Por. Jap'd.....doz. 70@75¢
Door, Por. Nickel..doz. $2.05@2.15
Bardsley's Wood Door, Shutters, &c.15%
Picture, Sargent's.....60&10&10%

Lacing, Leather—

See *Belting, Leather—*

Ladders, Store, &c.—

Lane's Store.....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladles, Melting—

L. & G. Mfg. Co. (low list).....25%
P. S. & W.....50%
Reading.....60%
Sargent's.....50&10%

Lanterns—Tubular—

Regular Tubular, No. 0.....
doz. $4.25@4.85
Lift Tubular, No. 0.....
doz. $4.50@5.15
Hinge Tubular, No. 0.....
doz. $4.50@5.15
Other Styles.....40&10@40&10&5%

Bull's Eye Police—

No. 1, 2¾-inch.....$2.50@2.75
No. 2, 3-inch.....$2.75@3.00

Lasts and Stands, Shoe—

Stowell's Atlas, Malleable Iron.....50%
Stowell's Badger, Cast Iron.....50%

Latches— Thumb—

Roggin's Latches, with screw..
doz. 35@40¢

Door—

Cronk & Carrier Mfg. Co., No. 101, ℔ doz. $2.90
Cronk & Carrier Mfg. Co., Latch, Hasp and Staples.....50%
Richards' Bull Dog, Heavy, No. 125.....50&5%
Richards' Trump, No. 127.....$1.50

Leaders, Cattle—

Small.....doz. 50¢; large, 60¢
Covert Mfg. Co., Cotton and Hemp.45%

Lifters, Transom—

R. & E.....33¼%

Lines—

Wire Clothes, Nos.	*18*	*19*	*20*
100 feet	*$2.20*	*2.00*	*1.70*
75 feet	*$1.80*	*1.70*	*1.30*

Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....℔ gr. 20%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%
Anniston Waterproof Clothes, 50 ft., ℔ gro., $24.00; Gilt Edge, $22.00; Air Line, $22.00; Acme, $17.00; Alabama, $15.00; Empire, $14.00; Advance, $13.50; Oriole, $20.00; Albemarle, $13.50; Eclipse, $12.50; Chicago, $11.00; Standard, $10.00; Columbia, $8.50; Allston, $12.50; Calhoun, $11.00.

Locks— Cabinet—

Cabinet Locks...33⅓@33⅓&7½%

Door Locks, Latches, &c.—

NOTE.—Net Prices are very often made on these goods.

Reading Hardware Co.....40%
R. & E. Mfg. Co.....40%
Sargent & Co.....40&10%
Stowell's Steel Door Latches.....50%

Elevator—

Stowell's.....50%

Padlocks—

Wrought Iron....75&10&5@80&6&%
R. & E. Mfg. Co. Wrought Steel and Brass.....75&10%

Sash, &c.—

Ives' Patent:
Bronze and Brass.....62½%
Crescent.....50&10%
Iron.....62½%
Window Ventilating.....60%
Robison Patent Ventilating Sash Lock.....40%
Wrought Bronze and Brass.....55%
Wrought Steel.....55%
Pullman Patent Ventilating Lock..25%
Reading.....40%

Machines—Boring—

Com. Upr't, without Augers.$2.00
Com. Ang'l'r, without Augers.$2.25
Swan's Improved.....40&10%
Angular.
Jennings', Nos. 1 and 4.....50&5%
Millers' Falls.....5.75
Snell's, Rice's Pat. 2.50 2.75

Corking—

Reisinger Invincible Hand Power.....
℔ doz. $48.00

Fence—

Williams' Fence Machines....each, $5.50

Hoisting—

Moore's Anti-Friction Differential Pulley Block.....30%
Moore's Hand Hoist, with Lock Brake.....20%

Ice Cutting—

Chandler's.....12½%

Washing—

Boss Washing Machine Co.:	Per doz.
Boss No. 1	$57.00
Boss Rotary	$54.00
Champion Rotary Banner No. 1	$54.00
Standard Champion No. 1	$48.00
Standard Perfection	$26.00
Cinti Square Western	$30.00
Uneeda American, Round	$30.00

Mallets—

Hickory.....45&5@50%
Lignumvitæ.....45&5@50%
Tinners' Hickory and Applewood.....doz. 45&5@50%

Mangers, Stable—

Swett Iron Works.....50%

Mashers, Vegetable—

Western, W. G. Co., Potato....60&10%

Mats, Door—

Elastic Steel (W. G. Co.), new list..
50&10%

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co.....25@30%
National list Jan. 1, 1902.....30%
Parker's Columbia & Victoria.50&10@60%
Parker's Box and Side.....50&10@60%
Swift, Lane Bros. Co.....30%

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheapest.....all sizes, $1.85@2.00
Cheap.....all sizes, $2.00@2.50
Better Grade..all sizes, $2.50@4.50

	12	*14*	*16*	*18-in.*
High Grade	*$4.50*	*4.75*	*5.00*	*5.25*

Coutinental.....60&5%
Great American.....70%
Great American Ball B'r'g, new list.70%
Quaker City.....70%
Pennsylvania.....60&5%
Pennsylvania, Jr., Ball Bearing....60%
Pennsylvania Golf.....50%
Pennsylvania Horse.....33⅓&5%
Pennsylvania Pony.....40&5%
Granite State:
Style A, Low Wheel....70&10&10&5%
Style B, Low Wheel.....70&10&5%
Style C, High Wheel.....70&10%
Style D, High Wheel.....70%
Philadelphia:
Styles M., S., C., K., T.....70&5%
Style A, all Steel.....60&5%
Style E, High Wheel.....70&10&5%
Drexel and Gold Coin, special list.50%

Nails—

Wire Nails and Brads, Papered, List July 20, 1899..85&10&10@90%
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers' &c. See *Tacks.*

Horse—

Nos.	*6*	*7*	*8*	*9*	*10*	
Anchor	*23*	*21*	*20*	*19*	*18*	*...40&5%*
Champlain	*28*	*26*	*25*	*24*	*23*	*.....50%*
Coleman	*13*	*12*	*12*	*11*	*11*	*.....net*
New Haven	*25*	*21*	*20*	*19*	*18*	*...40&5%*
Putnam	*23*	*21*	*20*	*19*	*18*	*....33⅓%*
New Putnam	*19*	*18*	*17*	*16*	*16*	*...10&10%*
Western						*℔ lb 8½¢*

Jobbers' Special Brands.....
per lb. 8½@11¢

Picture—

	1½	*2*	*2½*	*3*	*3½ in.*
Brass H'd.	*.45*	*.55*	*.60*	*.70*	*.. gro*
Por. Head	*1.10*	*1.10*	*1.10*		*.. gro*

Nippers—

See *Pliers and Nippers.*

Nuts—

Cold Punched: *Off list.*
Mfrs. or U. S. Standard.
Square, Blank or Tapped..$5.00
Hexagon, Blank or Tapped.$5.15
Square, Blank, C. T.....$5.30
Hexagon, Blank, C. T....$6.05
Hot Pressed:
Mfrs., U. S. or Nar. Gauge Stan'd.
Square, Blank.....$5.30
Hexagon, Blank.....$5.20
Square, Tapped.....$5.20
Hexagon, Tapped.....$5.70

Oakum—

Best.....lb.6¼@6½¢
U. S. Navy.....lb.5¾@6¢
Navy.....lb.4½@5¢
Plumbers' Spun Oakum...2½@3¢
In carload lots ½¢ lb. off, f.o.b. New York.

Oil Tanks—See *Tanks, Oil.*

Oilers—

Brass and Copper.....50&10%
Tin or Steel.....65&10&10%
Zinc.....65&10&10%
Chase or Paragon:
Brass and Copper.....50&10%
Tin or Steel.....65&10%
Zinc.....65&10%
Malleable, Hammers' Imp'ed, Nos. 11, 12 and 13.....20%
Malleable, Hammers' Old Pattern, Nos. 1, 2 and 3.....50%
American Tube & Stamping Co.:
Spring Bottom Cans.....10@70&10%
Railroad Oilers, &c.....60@60&10%

Openers— Can—

Per doz.
Sprague, Iron Handle....30@35¢
Sprague, Wood Handle...35@40¢
Sardine Scissors.....$1.75@$3.00
National.....50&10%
Stowell's Sprague.....℔ doz. 35@45¢
Vim Tin Shear and Can Opener, ℔ doz., 75c.; per gro., $7.50

Egg—

Nickel Plate.....℔ doz., $2.00
Silver Plate.....℔ doz., $4.00

Packing—

Asbestos Packing, Wick and Rope.....lb. 14@16¢

Rubber—

(Fair quality goods.)

Sheet, C. I.....8@10¢
Sheet, C. O. S.....9@13¢
Sheet, C. B. S.....10@14½¢
Sheet, Pure Gum.....50@65¢
Sheet, Red.....40@50¢
Jenkins' '96, ℔ lb 80¢.....25@25&5%

Miscellaneous—

American Packing...lb. 7@10 ¢
Cotton Packing.....lb. 16@25 ¢
Italian Packing.....lb. 9@12½¢
Jute.....lb. 4@ 4½¢
Russia Packing.....lb. 8@11 ¢

Pails, Creamery—

S. S. & Co., with gauges—No. 1, $6.25; No. 2, $6.50 ℔ doz.

Pails, Water, Well, &c.—

See *Buckets.*

Pans— Dripping—

Standard List.60&10@60&10&12½%

Fry—

Common Lipped:

Nos.	*1*	*2*	*3*	*4*	*5*
Per doz.	*$0.75*	*0.80*	*0.90*	*1.10*	*1.30*

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz	*$1.95*	*2.25*	*2.80*	*3.15*

Roasting and Baking—

Regal, S., S. & Co., ℔ doz., Nos. 5, $1.50; 10, $5.25; 20, $5.75; 30, $6.25.
Savory, ℔ doz., net, Nos. 200, $9.00; 400, $15.00.
Simplex, ℔ gro.:

No.	40	50	60	140	150	160
	$30.00	35.00	42.00	34.00	39.00	46.00

Paper—Building Paper

Asbestos: *lb.*
Mill Board, sheet, 40x40 in., 1-32 to ⅛ in.....10¢ } *1-32 to 1-8 in.*
Paper, 1-16 in. and under..6¢ } *1-32 to 1-8 in.*
Roll Board, 3-32 and ⅛ in..8¢

Per roll
Rosin Sized Sheathing, 500 sq. ft. Light weight, 25 lbs. to roll
35@40¢
Medium weight, 30 lbs. to roll,
40@45¢
Heavy weight, 40 lbs. to roll..
56@60¢
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton.....$38.00@40.00
Red Rope Roofing, 250 sq. ft. per roll.....$1.75

Tarred Paper—

1 ply (roll 300 sq. ft.), ton....
$32.50@35.50
2 ply, roll 108 sq. ft.....55@60¢
3 ply, roll 108 sq. ft.....78@85¢

Slater's Felt (roll 500 sq. ft.) .75¢
R. R. M. Stone Surfaced Roofing (roll 110 sq. ft.) $2.75

Sand and Emery—

Flint Paper and Cloth .60@60&10%
Garnet Paper and Cloth 25%
Emery Paper and Cl'h .50&10@60%

Parers— Apple—

Advance ..... ℔ doz. $4.00
Baldwin ..... ℔ doz. $4.00
Bonanza Improved ..... each $6.50
Daisy ..... ℔ doz. $4.00
Handy ..... each $7.50
Eureka Improved ..... each $20.00
Family Bay State ..... ℔ doz. $15.00
Improved Bay State ..... ℔ doz. $36.00
Little Star ..... ℔ doz. $5.00
New Lightning ..... ℔ doz. $7.00
Reading 72 ..... ℔ doz. $3.25
Reading 78 ..... ℔ doz. $6.25
Rocking Table ..... ℔ doz. $6.20
Turn Table '98 ..... ℔ doz. $6.00
White Mountain ..... ℔ doz. $5.00

Potato—

Saratoga ..... ℔ doz. $7.00
White Mountain ..... ℔ doz. $6.00

Picks and Mattocks—

List Feb. 23, 1899 ..... 75@75&5%
Cronk's Handled Garden Mattock, ℔ doz., $6.40 ..... 33⅓%

Pinking Irons—

See *Irons, Pinking.*

Pins, Escutcheon—

Brass ..... 60@60&10%
Iron, list Nov. 11, '85 .. 60@60&10%

Pipe, Cast Iron Soil—

Carload lots.

Standard, 2-6 in. 60%
Extra Heavy, 2-6 in. 70%
Fittings 75%

Pipe, Merchant—

Consumers, Carloads.

	Steel.		*Iron.*	
	Blk.	*Galv.*	*Blk.*	*Galv.*
⅛ & ¼ in.	*71%*	*55%*	*68½%*	*52½%*
⅜ & ½ in.	*75%*	*63%*	*72½%*	*60½%*
¾ to 6 in.	*79%*	*69%*	*77%*	*67%*
7 to 12 in.	*74%*	*59%*	*72%*	*56½%*

Pipe, Vitrified Sewer—

Carload lots.

Standard Pipe and Fittings, 2 to 24 in.:
New England 68%
New York and New Jersey .71%
Maryland, Delaware, E. Pa. 75%
West. Pa. and West Va. 77%
Virginia 76%
Ohio, Michigan and Ky. 77%
Indiana 77%
NOTE.—Carload lots are generally delivered.

Pipe, Stove—

Edwards' Nested Stove Pipe:

	C. L.	L. C. L.
5 in., per 100 joints	$7.00	$8.00
6 in., per 100 joints	7.50	8.50
7 in., per 100 joints	8.50	9.50

Planes and Plane Irons—Wood Planes—

Bench, first qual. ..... 40&10%
Bench, Second qual. ..... 50&10%
Molding ..... 33⅓&10%
Bailey's (Stanley R. & L. Co.) 40%
Chapin-Stephens Co.:
Bench, First Quality ..... 40@40&10%
Bench, Second Quality ..... 50@50&10%
Molding ..... 33⅓@33⅓&10%
Toy and German ..... 40@40&10%
Chaplin's 60%
Ohio Tool Co.:
Bench, First Quality ..... 40@40&10%
Bench, Second Quality ..... 50@50&10%
Molding ..... 33⅓@33⅓&10%
Adjustable Wood Bottom 60%
Union 60%

Iron Planes—

Bailey's (Stanley R. & L. Co.) 40%
Chaplin's Iron Planes ..... 50&10%
Miscellaneous Planes (Stanley R. & L. Co.) 35%
Ohio Tool Co.'s Iron Planes 60%
Sargent's ..... 60&10%
Union 60%

Plane Irons—

Wood Bench Plane Irons ..... 25&10@30%
Buck Bros. 30%
Chapin-Stephens Co. ..... 30@30&10%
Ohio Tool Co. 30%
Stanley R. & L. Co. 35%
Union 50%
L. & I. J. White ..... 20&5@25%

Planters, Corn, Hand—

Kohler's Eclipse ..... ℔ doz. $8.50

Plates—

Felloe ..... lb. 3¾@4¼¢
Self-Sealing Pie Plates (S., S. & Co.) ℔ doz. $2.00 ..... 50%

Pliers and Nippers—

Button Pliers ..... 75&10@80%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.
Gas Pipe.. 7 8 10 12-in.
$2.00 $2.25 $3.00 $3.75
Acme Nippers ..... 50&5%
Cronk & Carrier Mfg. Co.:
American Button ..... 75&10%
Cronk's 60%
Stub's Pattern 50%
Combination and others 33⅓%
Heller's Farriers' Nippers, Pincers and Tools ..... 40&10@40&10&10%
The Nettleton Mfg. Co. Reversible Cutting Nippers 50%
P. S. & W. Tinners' Cutting Nippers 40%
Swedish Side, End and Diagonal Cutting Pliers 50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds 40%

Plumbs and Levels—

Chapin-Stephens Co.:
Plumbs and Levels ..... 30@30&10&10%
Chapin's Imp. Brass Cor. 40@40&10&10%
Pocket Levels ..... 30@30&10&10%
Disston's Plumbs and Levels 70%
Disston's Pocket Levels 10%
C. E. Jennings & Co.'s Iron 33⅓%
C. E. Jennings & Co.'s Iron, Adjustable ..... 40&7½%
Stanley R. & L. Co. 45%
Stanley's Duplex 35%
Woods' Extension 33⅓%

Poachers, Egg—

Buffalo Steam Egg Poachers, ℔ doz., No. 1, $6.00; No. 2, $9.00; No. 3, $9.00; No. 4, $12.00 ..... 50%

Points, Glaziers'—

Bulk and 1-lb. papers, lb. 8½@9 ¢
¼-lb. papers ..... lb. 9 @9½¢
¼-lb. papers ..... lb. 9¾@10¼¢

Pokes, Animal—

Ft. Madison Hawkeye ..... ℔ doz. $3.25
Ft. Madison Western ..... ℔ doz. $4.00

Police Goods—

Manufacturers' Lists .. 25@25&5%
Tower's 25%

Polish—Metal, Etc—

Glasbrite, No. 2, 5 lb can (powder), each, $1.25; ℔ doz., $12.00; No. 2, 10 lb can (cake), each, $2.50; ℔ doz., $24.00.
Prestoline Liquid, No. 1 (½ pt.), ℔ doz., $3.00; No. 2 (1 qu.), $9.72 .... 40%
Prestoline Paste 40%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ℔ doz. 50¢; ℔ gro. $4.50; ½ lb boxes, ℔ doz. $1.25; 1 lb boxes, ℔ doz. $2.25.
U. S. Liquid, 8 oz. cans, ℔ doz., $1.25; ℔ gro., $12.00.
Barkeepers' Friend Metal Polish, ℔ doz., $1.75; ℔ gro., $18.00.
Wynn's White Silk, ½ pt. cans, ℔ doz. $2.00

Stove—

Black Eagle Benzine Paste, 5 lb cans, ℔ lb 10¢
Black Eagle, Liquid, ½ pt. cans.. ℔ doz. 75¢
Black Jack Paste, ¾ lb cans, ℔ gr. $9.00
Black Kid Paste, 5 lb can .... each, $0.65
Ladd's Black Beauty Liquid, per 100 tins $6.75
Joseph Dixon's, ℔ gr. $5.75 ..... 10%
Dixon's Plumbago ..... ℔ lb 8¢
Fireside ..... ℔ gr. $2.50
Gem, ℔ gr. $1.50 ..... 10%
Japanese ..... ℔ gr. $3.50
Jet Black ..... ℔ gr. $3.50
Peerless Iron Enamel, 10 oz. cans.. ℔ doz. $1.50
Wynn's:
Black Silk, 5 lb pail ..... each 70¢
Black Silk, ½ lb box ..... ℔ doz. $1.00
Black Silk, 5 oz. box ..... ℔ doz. $0.75
Black Silk, ½ pt. liq. ..... ℔ doz. $1.00

Poppers, Corn—

1 qt., Square ..... gro. $9.00
1 qt., Round ..... gro. $10.00
1½ qt., Square ..... gro. $11.00
2 qt., Square ..... gro. $13.00

Post Hole and Tree Augers and Diggers—

See also *Diggers, Post Hole, &c.*

Posts, Steel—

Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts ..... each $1.30

Potato Parers—

See *Parers, Potato.*

Pots, Glue—

Enameled 40%
Tinned 35%

Powder—

In Canisters:
Duck, 1 lb ..... each 45¢
Fine Sporting, 1 lb .... each 75¢
Rifle, ½-lb ..... each 15¢
Rifle, 1-lb ..... each 25¢
In Kegs:
12½-lb. kegs $3.50
25-lb. kegs $4.50
King's Semi-Smokeless:
Keg (25 lb bulk) $6.50
Half Keg (12½ lb bulk) $3.50
Quarter Keg (6¼ lb bulk) $1.90
Case 24 (1 lb cans bulk) $8.50
Half case (1 lb cans bulk) $4.50

King's Smokeless:	Shot Gun.	Rifle.
Keg (25 lb bulk)	$12.00	$15.00
Half Keg (12½ lb bulk)	6.25	7.75
Quarter Keg (6¼ lb bulk)	3.25	4.00
Case 24 (1 lb cans bulk)	14.00	17.00
Half case 12 (1 lb c. bk)	7.25	8.75

Robin Hood Sm'less Shot Gun .. 50&20%

Presses—Fruit and Jelly—

Enterprise Mfg. Co. ..... 20@25%

Seal Presses—

Morrill's No. 1, ℔ doz., $20.00 ..... 50%

Pruning Hooks and Shears

See *Shears.*

Pullers, Cork—

Invincible Cork Puller $21.00

Pullers, Nail—

Cyclops 50%
Miller's Falls, No. 3, ℔ doz., $12.00.. 33⅓&10%
Morrill's No. 1, Nail Puller, ℔ doz. $20.00 ..... 50%
Pearson No. 1, Cyclone Spike Puller, each $30.00 ..... 50%
Pelican, ℔ doz. $9.00 ..... 40&10%
Scranton, Case Lots:
No. 2B (large) $5.50
No. 3B (small) $5.00
Smith & Hemenway Co.:
Diamond B, No. 2, case lots.. ℔ doz. $6.00
Diamond B, No. 3, case lots.. ℔ doz. $5.50
Giant No. 1, ℔ doz. $18; No. 2, $16.50; No. 3, $15 ..... 33⅓%
Staple Pullers 60%
Parrot Tack and Stub Puller, ℔ doz., 75c.; ℔ gro., $6.00

Pulleys, Single Wheel—

Inch	*1½*	*1¾*	*2*	*3*
Awning or Tackle, doz.	*$0.30*	*.45*	*.60*	*1.05*

Hay Fork, Swivel or Solid Eye. doz., ¼ in., $1.25; 5 in., $1.55

Inch	*2*	*2¼*	*2½*
Hot House, doz.	*$0.65*	*.85*	*1.20*
Inch	*1¼*	*1½*	*1¾*	*2*
Screw, doz.	*$0.16*	*.19*	*.23*	*.30*
Inch	*1¾*	*2*	*2¼*	*2½*
Side, doz.	*$0.25*	*.40*	*.55*	*.60*
Inch	*1½*	*1¾*	*2*	*2½*

Stowell's:
Ceiling or End, Anti-Friction .. 60&10%
Dumb Waiter, Anti-Friction .. 60&10%
Electric Light 60%
Side, Anti-Friction ..... 60&10%

Sash Pulleys—

Common Frame; Square or Round End, per doz., 1¾ and 2 in. ..... 16@19¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in.. 16@19¢
Acme ..... 1¾ in., 16¢; 2 in., 19¢
Fox-All-Steel, Nos. 3 and 7, 2 in.... ℔ doz. 50%
Grand Rapids All Steel Noiseless .. 50%
Ideal ..... 70&10%
Niagara ..... 1¾ in., 16¢; 2 in., 19¢
No. 26, Troy .. 1¾ in., 14½¢; 2 in., 16½¢
Star ..... 1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See Blocks.

Pumps—

Cistern ..... 60@60&10%
Pitcher Spout ..... 80@80&10%
Wood Pumps, Tubing, &c. 45@50%
Barnes Dbl. Acting (low list) 50%
Barnes' Pitcher Spout ..... 75&10&5%
Contractors' Rubber Diaphragm No. 2, B. & L. Block Co. $16.00
Daisy Spray Pump ..... ℔ doz. $6.75
Flint & Walling's, Fast Mail Hand, (low list) 55%
Flint & Walling's Fast Mail (low list) ..... 55&5%
Flint & Walling's Tight Top Pitcher .80%
National Specialty Mfg. Co., Measuring, $6.00 ..... 30%
Mechanical Sprayer $6.00
Myers' Pumps (low list) 50%
Myers' Power Pumps 50%
Myers' Spray Pumps ..... 50&10%

Pump Leathers—

Plunger and Lower Valve—Per gro.:

Inch...	*2*	*2¼*	*2½*	*2¾*
	$2.20	*2.50*	*2.75*	*3.00*
Inch...	*3*	*3¼*	*3½*	*3¾*	*4*
	$3.30	*3.60*	*3.85*	*4.10*	*4.40*

Plunger Cup Leathers—Per 100:

Inch...	*2½*	*3*	*3½*	*4*
	$2.75	*3.85*	*5.00*	*6.00*

Punches—

Saddlers' or Drive, good ..... doz. 50@75¢
Spring, single tube, good quality ..... $1.75@2.00
Revolving (4 tubes) ..... doz. $3.50@3.75
Bemis & Call Co.'s Cast St'l Drive .. 50%
Bemis & Call Co.'s Check 55%
Morrill's Nos. 1AA, 1A, 1B, 1C, $15.00 ..... 50%
Hercules, 1 die, each $5.00 ..... 50%
Niagara Hollow Punches 40%
Niagara Solid Punches ..... 55&10%
Steel Screw, B. & K. Mfg. Co. 50%
Tinners' Hollow, P., S. & W. Co. .. 40%
Tinners' Solid, P., S. & W. Co., ℔ doz., $1.44 ..... 60%

Rail—Barn Door, &c.—

Sliding Door, Painted Iron ..... 2½@2¾¢
Sliding Door, Wrought Brass, 1½ in., lb., 36¢ 30%
Allith Mfg. Co.:
No. 1, Reliable Hgr. Track, ℔ ft. 5½¢
No. 2, Reliable Hgr. Track, ℔ ft. 7¢
Cronk's:
Double Braced Steel Rail .. ℔ ft. 2¾¢
O. N. T. Rail ..... 2¼¢
Griffin's:
XXX, ℔ 100 ft., 1 x 3-16 in., $3.00; 1¼ x 3-16 in., 3.50.
Hinged Hanger, ℔ 100 ft., 1 x 3-16 in., $3.10; 1¼ x 3-16 in., $3.60.
Lane's:
Hinged Track, ℔ 100 ft., 1 in., $3.40; 1¼ in., $4.10.
O. N. T., ℔ 100 ft., 1 in., $2.75; 1¼ in., $3.50; 1½ in., $4.00.
Standard, 1¼ in. ..... ℔ 100 ft. $4.00
Lawrence Bros.: ℔ 100 ft. No. 201, $4.00; No. 202, $4.00
New York, 1 x 3-16 in., ℔ 100 ft. $2.75
McKinney's:
Hinged Hanger Rail, ℔ ft., 11¢ .. 50%
None Better ..... ℔ ft. 3¾¢
Standard ..... ℔ ft. 4¢
Myers' Stayon Track ..... 60&10%
Richards' Mfg. Co.:
Common 1 x 3-6 in., $2.25; 1¼ x 3-16, $2.50; 1¼ x 3-16, $2.75.
Special Hinged Hanger Rail .. 60&10%
Lag Screw Rail, No. 65 ..... 50%
Gauge Trolley Track, ℔ ft., No. 31, 9¢; No. 32, 14¢; No. 33, 20¢.
Safety Door Hanger Co.'s Storm King Safety 60%
Safety Door Hanger Co.'s U. S. Standard 60%
Stowell's:
Cast Rail ..... ℔ ft. 1¾¢
Steel Rail, Plain 25%
Wrought Bracket, 1 3-16 in.. ℔ ft. 3¢
Wrought Bracket, 1½ x 5-16.. ℔ ft. 7¢
Swett's Hylo, ℔ ft. 11¢ 60%
P. L. B. Steel Rail ..... ℔ 100 ft. $3.00
No. 0, 1 x 3-16 ..... ℔ 100 ft. $2.75

Rakes—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Fort Madison Red Head Lawn $3.25
Fort Madison Blue Head Lawn $2.70
Jackson Lawn, 29 and 30 teeth, ℔ doz., net $4.25
Cronk's:
New Champion Garden, ℔ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00 .. 75%
Victor Garden, ℔ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00 ..... 80%
Queen City Lawn, ℔ doz., 20 teeth, $3.45; 24, $3.60 ..... net.
Anticlog Lawn, ℔ doz. $4.00
Malleable Garden ..... 70&10%
Kohler's:
Lawn Queen, 20-tooth ..... ℔ doz. $3.45
Lawn Queen, 24-tooth ..... ℔ doz. $3.60
Paragon, 20-tooth ..... ℔ doz. $2.75
Paragon, 24-tooth ..... ℔ doz. $3.00
Steel Garden, 14-tooth .... ℔ doz. $2.40
Malleable Garden, 14-tooth, ℔ doz. $1.75@2.00
Weldless Steel Garden ..... 75&5%

Rasps, Horse—

Disston's 75%
Heller Bros.' ..... 70&5@70&10&5%
McCaffrey's American St'd .. 60&10&5%
New Nicholson ..... 70&10@75%
See also Files.

Razors—

Boras—I. C. 60%
Fox Razors, No. 42 .. ℔ doz. $20.00
Fox Razors, No. 44 .. ℔ doz. $20.00
Fox Razors, No. 82, Platina.... ℔ doz. $25.00
} Dis. 40%
Red Devil 50%
Silberstein:
Carbo Magnetic $18.00
Griffon, No. 65 ..... $15.00
Griffon, No. 00 ..... $12.00
All other Razors 40%

Safety Razors—

Silberstein 40%

Reels, Fishing—

Hendryx:
M 6, Q 6, A 6, B 6, M 9¾, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickeled Populo 20%
Aluminum, German Silv., Bronze .. 25%
1240 N, 124 N 20%
3004 N, 06 N, 6 RM, G 9 ..... 25%
4 N, 6 PN, 24 N, 26 PN 20%
2904 P 33⅓%
2904 PN 33⅓%
0924 N 33⅓%
02064 N 33⅓%
002904 PN 33⅓%
802 N 33⅓%
986 PN, 2904 N, 974 PN 25%
5009 PN, 5009 N 20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR 20%
304 P, 304 PN, 00304 P, 00304 PN .. 33⅓%

Registers—*List July 1, 1903.*

Japanned, Electroplated and Bronzed ..... 70&10%
Bronzed 75%

Revolvers—

Single Action ..... 95¢@$1.00
Double Action, except 44 cal. $1.85
Double Action, 44 caliber $2.00
Automatic $3.45
Hammerless $4.00
Thayer Robertson & Cary:
Automatic ..... each $2.75
Hammerless ..... each $3.25

Riddles, Hardware Grade

16 in. ..... per doz. $2.25@$2.50
17 in. ..... per doz. $2.50@$2.75
18 in. ..... per doz. $2.75@$3.00

Rings and Ringers—Bull Rings—

	2	*2½*	*3 inch.*
Steel	*$0.70*	*0.75*	*0.80 doz.*
Copper	*$1.00*	*1.15*	*1.40 doz.*

Rea's Improved Self-Piercing, Copper, 2 in., ℔ doz., $1.25; 2½ in., $1.50; 3 in., $1.75.

Hog Rings and Ringers—

Hill's Rings, gro. boxes .$4.00@4.50
Hill's Ringers, Gray Iron ..... doz. 50@55¢
Hill's Ringers, Malleable Iron .. doz. 70@75¢
Blair's Rings ... per gro. $4.75@5.25
Blair's Ringers. per doz. $0.60@ .65
Brown's Rings .. per gro. $5.00@5.50
Brown's Ringers. per doz. $0.60@ .65

Rivets and Burrs—

Copper ..... 50&10@50&10&5%
Iron or Steel ..... 75@75&5%

Rollers—

Acme, Stowell's Anti-Friction 50%
Barn Door, Sargent's list 60%
Cronk's Stay No. 65, $0.90; No. 50 ..... $1.00
Cronk's Brinkerhoff No. 55, $0.60; No. 56 ..... $0.84
Lane's Stay 40%
Richards' Stay:
Handy Adj. and Reversible No. 53 .75¢
O. K. Adj. and Reversible No. 58 .50¢
Lag Screw, Nos. 55 and 57 ..... 50%
Underwriters', Nos. 59, 60 ..... 50%
Favorite, No. 54 ..... 60%
Stowell's Barn Door Stay .. ℔ doz. $1.00
Swett's Anti-Friction 50%
Screw and Spike Stay ..... ℔ doz. 65¢
Hinge Adjustable Stay ..... ℔ doz. 90¢

Rope—

Manila, 7-16 in. diam. and larger: Pure ..... lb., 12½¢
Sisal, 7-16 in. diam. and larger: Pure ..... lb., 10¢
Sisal, 7-16 in. diam. and larger: No. 2 quality ..... lb., 8¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse: Mixed ..... lb., 8¢
Pure ..... lb., 9¢
Sisal, Tarred, Medium Lath Yarn: Mixed ..... lb. 7½¢
Pure ..... lb. 8½¢
Cotton Rope, on reels: Lb.
Best, ¼-in. and larger. 16½@18¢
Medium, ¼-in. and larger. 15½@16½¢
Common, ¼-in. and larger .. 10¢
In coils, ½¢ advance.
Jute Rope:
Thread No. 1, ¼-in. & up. lb. 6¾¢
Thread No. 2, ¼-in. & up, lb. 5¾¢
Old Colony Manila Transmission Rope ..... ℔ lb 17¼¢

Wire Rope—

Galvanized ..... 37½&21½%
Plain ..... 45&21½%

Ropes, Hammocks—
Covert Mfg. Co.:
Jute 50%
Sisal ..... 30&10%
Covert Saddlery Works..... 60&5%

Rulers, Desk—
Stimpson & Son.
Boxwood and Maple..... 30&10%

Rules—
Boxwood ..... *60&10&10%*
Ivory ..... *35&10@35&10&10&5%*
Chapin-Stephens Co.:
Boxwood ..... 60@60&10%
Flexifold ..... 27½&10&10&2½%
Ivory ..... 35@35&10&10%
Miscellaneous ..... 50@50&10&10%
Combination ..... 55@55&10%
Stationers' ..... 10@10&10%
Keuffel & Esser Co.:
Folding, Wood..... 35&10%
Folding, Steel..... 33⅓&10%
Lufkin's Steel..... 50&10%
Lufkin's Lumber..... 60%
Stanley R. & L. Co.:
Boxwood 62½%
Ivory 45%
Miscellaneous 60%
Zig Zag 40%
Zig Zag Pin Joint..... 42½%
Upson Nut Co.:
Boxwood ..... 60@60&10%
Ivory ..... 35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—
See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—
Atkins':
Circular 50%
Band ..... 50&10&10%
Cross Cuts..... 35&5%
Mulay, Mill and Drag..... 50%
One-Man Saw..... 40%
Wood Saws..... 40%
Hand, Compass, &c..... 40%
Chapin-Stephens Co.:
Turning Saws and Frames..30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws.....30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth.50%
Band, 2 to 1¼ in. wide..... 60%
Band, ⅛ to 1⅛..... 60%
Crosscuts 50%
Narrow Crosscuts..... 55%
Mulay, Mill and Drag..... 50%
Framed Woodsaws..... 35%
Woodsaw Blades..... 35%
Woodsaw Rods..... 25%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77, 8..... 25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination..... 30%
Compass, Key Hole, &c..... 25%
Butcher Saws and Blades..... 35%
C. E. Jennings & Co.'s:
Back Saws..... 25%
Butcher Saws..... 30%
Compass and Key Hole Saws..35&5%
Framed Wood Saws..... 30%
Hand Saws..... 20&2½%
Wood Saw Blades..... 35%
Millers Falls:
Butcher Saws..... 15&10%
Star Saw Blades..... 15&10%
Peace & Richardson's Hand Saws...30%
Simonds':
Circular Saws..... 50%
Crescent Ground Cross Cut Saws..35%
One-Man Cross Cuts..... 40&10%
Gang Mill, Mulay and Drag Saws.50%
Band Saws..... 50%
Back Saws..... 25@25&7½%
Butcher Saws..... 35@35&7½%
Hand Saws..... 25@25&7½%
Hand Saws, Bay State Brand..... 45%
Compass, Key Hole, &c..25@25&7½%
Wood Saws..... 35@35&7½%
Springfield Mach. Screw Co.:
Diamond Kitchen Saws....40&10@50%
Butcher Saws Blades.....35@40%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws..... 50%

Hack Saws—
Atkins' Hack Saw Blades A A A..25%
Disston's:
Concave Blades..... 25%
Keystone 40%
Hack Saw Frames..... 30%
Fitchburg File Works, The Best...35%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180..... 40&7½%
Hack Saws, Nos. 175, 180, complete, 40&7½%
Goodell's Hack Saw Blades..... 40%
Griffin's Hack Saw Frames..35&5&10%
Griffin's Hack Saw Blades....35&5&10%
Springfield Mach. Screw Co.:
Diamond Hack Saw Blades..... 35%
Diamond Hack Saw Frames..... 50%
Star Hack Saws and Blades..... 15&10%
Sterling Hack Saw Blades....30&10&5%
Sterling Hack Saw Frames..30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00..10%
Victor Hack Saw Blades..... 25%
Victor Hack Saw Frames..... 40%

Scroll—
Barnes' No. 7, $15..... 25%
Barnes' Scroll Saw Blades..... 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20..... 20%
Lester, complete, $10.00..... 15&10%
Rogers, complete, $4.00..... 15&10%

Scalers, Fish—
Covert's Saddlery Works..... 60&10%

Scales—
Family, Turnbull's....50@50&10%
Counter:
Hatch, Platform, ½ oz. to ¼ lbs. ..... doz. $5.50
Two Platforms, ½ oz. to 8 lbs. ..... doz. $16.00
Union Platform, Plain.$1.70@1.90
Union Platform, Stpd.$1.85@2.15
Chatillon's:
Eureka 25%
Favorite 40%
Crocers' Trip Scales..... 50%
Chicago Scale Co.:
The "Little Detective"....25 lbs 50%
Union or Family No. 2..... 60%
Portable Platform (reduced list)..50%
Wagon or Stock (reduced list).25@35%
"The Standard" Portables..... 50%
"The Standard" R. R. and Wagon.50%

Scrapers—
Box, 1 Handle.....doz. $2.00@2.25
Box, 2 Handle.....doz. $2.60@2.85
Ship....Light, $2.00; Heavy, $4.50
Adjustable Box Scraper (S. R. & L. Co.), $6.00..... 45%
Chapin-Stephens Co., Box, 30@30&10&10%

Screens, Window and Frames—
Air Line Pattern Screens..... 60&10%
Flyer Pattern Screens..60&10@60&10&5%
Maine Screen Frames..... 40&10&5%
Perfection Screens..... 60&10@60&10&5%
Phillips' Screen Frames...60&5@60&10%
See also *Doors.*

Screws—Bench and Hand
Bench, Iron, doz., 1 in., $2.50@2.75; 1½, $3.00@3.25; 1¼ $3.50@3.75
Bench, W'd, Beech..doz. 30@30&5%
Hand, Wood..... 30@30&5%
R. Bliss Mfg. Co., Hand....30@30&10%
Chapin-Stephens Co., Hand..30@30&10%
Ohio Tool Co., Bench and Hand..30%

Coach, Lag and Hand Rail—
Lag, Cone Point, list Oct. 1, '99 ..... 75&15@—%
Coach, Gimlet Point, list Oct. 1, '99 ..... 75&10@—%
Hand Rail, list Jan. 1, '81.... 70&10@75%

Jack Screws—
Standard List..... 80@80&5%
Millers Falls..... 50&10&10%
Millers Falls, Roller..... 50&10%
P., S. & W..... 50%
Sargent ..... 70&10%
Swett Iron Works.....75&10@80&5%

Machine—
List Jan. 1, '98:
Flat or Round Head, Iron.... 50@50&10%
Flat or Round Head, Brass.... 50@50&10%

Set and Cap—
Set (Iron)..... 80%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap..... 75%
Hex. Hd. Cap..... 75%
Rd. Hd. Cap..... 60&10%
Fillister Hd. Cap.....60&10&10%

Wood—
List July 23, 1903.
Flat Head, Iron.....87½&10@..%
Round Head, Iron...85 &10@..%
Flat Head, Brass....85 &10@..%
Round Head, Brass..80 &10@..%
Flat Head, Bronze...77½&10@..%
Round Head, Bronze.75 &10@..%
Drive Screws.....87½&10%

Scroll Saws—
See *Saws, Scroll.*

Scythes—
	Per doz.
Grass, No. 1, Plain Finish...	*$6.25*
Clipper, Bronzed Webb...	*$6.50*
No. 3 Clipper, Pol'd Webb..	*$6.75*
No. 6 Clipper & Solid Steel.	*$7.00*
Bush, Weed & Bramble, No. 2.	*$6.50*
Grain, No. 1.....	*$8.25*
Bronzed Webb, No. 1.....	*$8.50*
Nos. 3 & 4 Clipper, Grain..	*$8.75*
Solid Steel No. 6.....	*$9.25*

Seeders, Raisin—
Enterprise ..... 25@30%

Sets—Awl and Tool—
Aiken's Sets, Awl and Tools:
No. 20, ℔ doz., $10.00..... 60&10%
Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7..... 50%
C. E. Jennings & Co.'s Model Tool Holders 30%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18....15&10%

Garden Tool Sets—
Ft. Madison Three Plows, Hoe, Rake and Shovel..... ℔ doz sets $9.00

Sets, Nail—
Octagon ..... gro. $3.50@3.75
Buck Bros..... 27½%
Cannon's Diamond Point, ℔ gro.$12.40%
Mayhew's ..... ℔ gro. $9.00
Snell's Cor'gated, Cup Pt...℔ gro. $7.20
Snell's Knurled, Cup Pt....℔ gro, $7.20
Springfield Mach. Screw Co.:
Diamond Knurled Cup Pt.℔ gro. $7.50

Rivet—
Regular list..... 75@75&10%

Saw—
Aiken's:
Genuine ..... 50&10%
Imitation ..... 50&10%
Atkin's:
Criterion 40%
Adjustable 40%
Bemis & Call Co.'s:
Cross Cut..... 30%
Plate 20%
Disston's Star and Monarch..... 25%
Morrill's No. 1, $15.00..... 50%
Nos. 3 and 4, Cross Cut, $20.00...50%
No. 5, Mill, $30.00..... 50%
Nos. 10, 11, 95, $15.60..... 50%
No. 1 Old Style, $10.00..... 50%
Special, $16.25..... 50%
Giant Royal Cross Cut.....℔ doz. $8.00
Royal, Hand..... ℔ doz. $4.50
Taintor Positive..... ℔ doz. $6.75

Shaving—
Fox Shaving Sets, No. 30 ..... ℔ doz., net, $24.00
Smith & Hemenway Co.'s..... 60%

Sharpeners, Knife—
Chicago Wheel & Mfg. Co..... 70%
Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ℔ doz..... $1.50
Mounted Kitchen Sand Stone, ℔ doz..... $1.50
Natural Grit Carving Knife Hones, ℔ doz..... $3.00
Quick Cut Emery Carving Knife Hones, ℔ doz..... $1.50
Quick Edge Pocket Knife Hones, ℔ doz..... $2.50
} 40%

Skate—
Smith & Hemenway Co..... 20%

Shaves, Spoke—
Iron ..... doz.$1.10@1.25
Wood ..... doz.$1.75@2.25
Bailey's (Stanley R. & L. Co.)....45%
Razor Edge (Stanley R. & L. Co.)..35%
Chapin-Stephens Co.....30@30&10&10%
Goodell's, ℔ doz. $9.00..... 15&10%
Wood's F1 and F2..... 50%

Shears—
Cast Iron..	*7*	*8*	*9 in.*
Best	*$16.00*	*18.00*	*20.00 gro.*
Good ...	*$13.00*	*15.00*	*17.00 gro.*
Cheap ..	*$5.00*	*6.00*	*7.00 gro.*

Straight Trimmers, &c.:
Best quality Jap....70@70&10%
Best quality, Nickel..60@60&10%
Fair quality, Jap....80@80&5%
Fair quality, Nickel..75@75&10%
Tailors' Shears..... 40@40&10%
Acme Cast Shears..... 40@40&5%
Heinisch's Tailor's Shears..... 10%
Wilkinson's Sheep, 1900 list..... 50&10%

Tinners' Snips—
Steel Blades..... 20&5@20&10%
Steel Laid Blades.....40&10@50%
Forged Handles, Steel Blades, Berlin, 50@50&5%
Heinisch's Snips..... 40%
Jennings & Griffin Mfg. Co.'s, 6¼ to 10 in..... 50%
Niagara Snips..... 40%
P., S. & W. Forged Handles..... 20%

Pruning Shears—
Cronk's Hand Shears..... 33⅓%
Cronk's Wood Handle Shears..... 33⅓%
Disston's Combined Pruning Hook and Saw, ℔ doz. $18.00..... 25%
Disston's Pruning Hook, ℔ doz. $12.00 ..... 25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades....50&10%
P. S. & W. Co..... 33⅓%
Wilkinson's Hedge, 1900 list..... 50&10%
Wilkinson's Lawn and Border..... 50%

Sheaves—Sliding Door—
Stowell's Anti-Friction..... 50%
Patent Roller, Hatfield's, Sargent's list ..... 70&10%
Reading 40%
R. & E. list..... 33⅓%
Wrightsville Hatfield Pattern..... 80%

Sliding Shutter—
Reading list..... 40%
R. & E. list..... 33⅓%
Sargent's list..... 10&10%

Shells—Shells, Empty—
Brass Shells, Empty:
Climax, Club, Rival, 10 and 12 gauge ..... 65&10%
Paper Shells, Empty:
Acme, Ideal, Leader, New Rapid, Magic, 10, 12, 16 and 20 gauge.25&10%
Blue Rival, New Climax, Challenge, Monarch, Defiance, Repeater, Yellow Rival, 10, 12, 16 and 20 gauge ..... 20&5%
Climax, Union, League, New Rival, 10 and 12 gauge..... 25&5%
Climax, Union, League, New Rival, 14, 16 and 20 gauge..... 20&5%
Expert, Metal Lined and Pigeon, 10, 12, 16 and 20 gauge..... 33⅓&5%
Robin Hood, Low Brass..... 20&10%
Robin Hood, High Brass..... 30&10%

Shells, Loaded—
Loaded with Black Powder..40%
Loaded with Smokeless Powder, medium grade..... 40&5%
Loaded with Smokeless Powder, high grade..... 40&10&10%
Robin Hood Smokeless Powder:
Robin Hood, Low Brass..... 50%
Comets, High Brass..... 50&10&5%

Shoes, Horse, Mule, &c.—
F.o.b. Pittsburgh:
Iron ..... per keg $4.00
Steel ..... per keg $3.75
Burden's, all sizes..... ℔ keg $3.90

Shot—
Drop, up to B, 25-lb. bag....$1.70
Drop, B and larger..... per 25-lb. bag, $1.95
Buck, 25-lb. bag..... $1.95
Chilled, 25-lb. bag..... $1.95

Shovels and Spades—
Association List, Nov. 15, 1902..40%

Snow Shovels—
Long Handle..... $2.25@$2.50
Wood and Mall, D. Handle, $2.75@$3.00

Sieves and Sifters—
Hunter's Imitation..... gro. $10.50@11.00
Hunter's Genuine..... per gro. $12.00@12.50
Buffalo Metallic Blued, S. S. Co., ℔ gr.:
14&16 16&18 18&20
$13.20 $13.50 $14.40
Shaker (Barler's Pat.) Flour Sifters, ℔ doz., $2.00..... 20%

Sieves, Seamless Metallic
—Per dozen.—
Mesh	*14*	*16*	*18*	*20*
Iron Wire	*$1.05*	*1.05*	*1.10*	*1.20*
Tinned Wire	*$1.15*	*1.15*	*1.20*	*1.30*

Sieves, Wooden Rim—
Nested, 10, 11 and 12 Inch.
Mesh 18, Nested....doz. $0.90@0.95
Mesh 20, Nested....doz. $1.00@1.05
Mesh 24, Nested....doz. $1.30@1.40

Sinks, Cast Iron—
Standard list..... 60@60&10%
Barnes' low list..... 60&5%

* *NOTE.—There is not entire uniformity in lists used by jobbers.*

Skeins, Wagon—
Cast Iron..... 80@80&10%
Steel ..... 40@40&10%

Slates, School—
Factory Shipments.
"D" Slates..... 50@50&10%
Eureka, Unexcelled Noiseless.. 60&5 tens
Victor A, Noiseless..... 60&5 tens

Slaw Cutters—See *Cutters.*

Snaps, Harness—
German ..... 40@40&10%
Covert Mfg. Co.:
Derby ..... 30&2%
High Grade..... 50%
Jockey 35%
Trojan 50%
Yankee ..... 30&2%
Yankee Roller..... 30&2%
Covert's Saddlery Works:
Crown 60%
German 60%
Model 60%
Triumph 60%
Oneida Community:
Harness Snaps, 1 inch..... 60&5%
Swivel Snaps..... 60%
Swivels 50%
Sargent's Patent Guarded....66⅔&10%

Snaths—
Scythe 50%

Snips, Tinners—See *Shears.*

Spoons and Forks—
Silver Plated—
Good Quality..... 50&10@60&5%
Cheap ..... 60@60&10%
International Silver Co.:
1847 Rogers Bros. and Rogers & Hamilton ..... 40&10%
Rogers & Bro., William Rogers' Eagle Brand..... 50&10%
Anchor, Rogers Brand..... 60%
Wm. Rogers & Son..... 60&10%

Miscellaneous—
German Silver..... 60@60&5%
Cattaraugus Cutlery Co.:
Seneca Silver..... 50%

Tinned Iron—
Teas ..... per gro. $5@$50
Tables..... per gro. $0.50@$1.00

Springs—Door—
Chicago (Coil)..... 40&10%
Gem (Coil)..... 20%
Pullman (Coil)..... 25%
Reliance (Coil)..... 40&10%
Star (Coil)..... 30%
Torrey's Rod, 39 in..... ℔ doz. $1.10
Victor (Coil)..... 50&10&10%

Carriage, Wagon, &c.—
1¼ in. and Wider:	*Per lb*
Black	*4@4¼¢*
Half Bright	*4@4¼¢*
Bright	*4½@4¾¢*

Painted Seat Springs:
1½ x 2 x 26..... per pr. 42¢
1½ x 3 x 28..... per pr. 70¢

Sprinklers, Lawn—
Enterprise ..... 25@30%
Philadelphia No. 1, ℔ doz. $12; No. 2, $15; No. 3, $24..... 30%
Pleuger & Henger Mfg. Co.:
Cactus 70%
Japanese 75%
Nationals 65%

Squares—
Nickel plated.. } *List Jan. 5, 1900.*
Steel and Iron.. } *75&5@75&10%*
Rosewood Hdl. Try Square and T-Bevels ..... 60&10&10@70%
Iron Hdl. Try Squares and T-Bevels ..... 40&10@40&10&10%
Disston's Try Sq. and T-Bevels....70%
Winterbottom's Try and Miter, No. 1, 40%; No. 2..... 50%

Squeezers, Lemon
Wood, Common, gro., No. 0, $5.25@$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap ..... doz. $1.00
Good Grade..... doz. $1.25
Tinned Iron..... doz. $0.75@1.25
Iron, Porcelain Lined...doz. $1.75

Staples—
Barbed Blind..... lb. 6@6½¢
Electricians', Association list.. 80&10&10&10%
Fence Staples, Plain, $2.25; Galvanized $2.55
Poultry Netting Staples..... per lb. 3¼@3½¢
Grand Crossing Tack Co.'s list..80&10%

Steels, Butchers'—
Dick's 30%
Foster Bros..... 30%
C. & A. Hoffmann's..... 40%

Steelyards—..... 30@30&10%

Stocks and Dies—
Blacksmiths'..... 50@50&10%
Curtis Rev'ble Ratchet Die Stock..25%
Derby Screw Plates..... 25%
Green River..... 25%
Lightning Screw Plate..... 25%
Little Giant..... 25%
Reece's New Screw Plates..... 25%

Stoners, Cherry—
Enterprise ..... 25@30%

Stones—Oil, &c.
Chicago Wheel & Mfg. Co., 1904 list:
Gem Corundum Oil, Double Grit.60%
Gem Corundum Axe, Single or Double Grit..... 60%
Gem Corundum Slips..... 60%
Gem Corundum Razor Hones..... 50%
Pike Mfg. Co., 1904 list: ℔ lb.
Arkansas St. No. 1, 3 to 5½ in.$2.60
Arkansas St. No. 1, 5½ to 8 in.$3.50
Arkansas Slips No. 1..... $4.00
Lily White Washita, 4 to 8 in.60¢
Rosy Red Washita, 4 to 8 in..60¢
Washita St., Extra, 4 to 8 in.50¢
Washita St., No. 1, 4 to 8 in.40¢
Washita St., No. 2, 4 to 8 in.30¢
Lily White Slips..... 90¢
Rosy Red Slips..... 90¢
Washita Slips, Extra..... 80¢
Washita Slips, No. 1..... 70¢
Washita Slips, No. 2..... 40¢

33⅓%

India Oil Stones (entire list)....33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit.....33⅓%
Quickcut Emery and Corundum Axe Stone, Double Grit.....33⅓%
Quickcut Emery Rubbing Bricks.33⅓%
Hindostan No. 1, R'g'lar.℔ lb 60¢
Hindostan No. 1, Small..℔ lb 10¢
Axe Stones (all kinds).....
Turkey Oil Stones, Extra, 5 to 8 in.....℔ lb 80¢
Queer Creek Stones, 4 to 8 in.20¢
Queer Creek Slips.....40¢
Sand Stone.....6¢
} 33⅓%

Scythe Stones—

Chicago Wheel & Mfg. Co.:
Gem Corundum, 10 in., $8.00 ℔ gro., 12 in., $10.80.
Norton Emery Scythe Stones:
Less than gross lots.....℔ gro. $9.00
One gross or more.....℔ gro. $7.20
Lots of 10 gross or more..℔ gro. $6.00
Pike Mfg. Co., 1901 list:
Black Diamond S. S..℔ gro. $12.00
Lamoille S. S.....℔ gro. $11.00
White Mountain S. S.℔ gro. $9.00
Green Mountain S. S..℔ gro. $6.00
Extra Indian Pond S.S.℔ gro. $7.50
No. 1 Indian Pond S.S.℔ gro. $7.00
No. 2 Indian Pond S.S.℔ gro. $4.50
Leader Red End S. S.℔ gro. $4.50
Quick Cut Emery....℔ gro. $10.00
Pure Corundum,.....℔ gro. $18.00
Crescent.....$7.00
Emery Scythe Rifles, 2 Coat. $8
Emery Scythe Rifles, 3 Coat. $10
Emery Scythe Rifles, 4 Coat, $12
Balance of 1904 list 33⅓%
} 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers.....℔ gro. $9.00

Stops— Bench—

Millers Falls.....15&10%
Morrill's, ℔ doz., No. 1, $10.00.....50%
Morrill's, No. 2, $12.50.....50%

Door—

Chapin-Stephens Co.....60@60&10%

Plane—

Chapin-Stephens Co.....20%

Straps— Box—

Cary's Universal, case lots.....25&20%

Hame—

Covert's Saddlery Works.....60&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 60@60&10%
Socket .....doz. $1.60
Excelsior Stretcher and Tack Hammer Combined, ℔ doz. $6.00.....20%

Stuffers, Sausage—

Enterprise Mfg. Co.....25@25&7½%
National Specialty Co., list Jan. 1, 1902 .....30&5%

Sweepers, Carpet—

National Sweeper Co.: ℔ doz.
Louis XV, Roller Bearing, Gold Plated $120.00
Hepplewhite, Roller Bearing, Silver Plated.....$72.00
Sheraton, Roller Bearing, N'kel.$60.00
Ye Mission, Roller Bearing, Oxidized Coppered.....$36.00
Transparent, Roller Bearing, Plate Glass top, Nickeled.....$36.00
National Queen, Roller Bearing, Fancy Veneers.....$27.00
Loyal, Roller Bearing, Veneers, Nickeled $25.00
Triple Medal, Roller Bearing, Nickeled $24.00
Marion, Roller Bearing, N'kel.$24.00
Marion Queen, Roller Bearing, Nickeled $21.00
Monarch, Roller Bearing, N'kel.$22.00
Monarch, Roller Bearing, Jap..$20.00
Perpetual, Regular B'r'gs, N'kel.$20.00
Perpetual, Regular B'r'gs, Jap..$18.00
Monarch Extra (17 in. case), Roller Bearing, Nickeled.....$36.00
Monarch Extra (17 in. case), Roller Bearing, Japanned.....$33.00
Auditorium (26 in. case), Roller Bearing, Nickeled.....$54.00
Mammoth (30 in. case), Roller Bearing, Nickeled.....$60.00

NOTE.—Rebates: 50c per dozen on three-dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten-dozen lots; $3.50 per dozen on twenty-five-dozen lots.

Streator Metal Stamping Co.:
Model E, Sanitaire.....℔ doz $25.00
Model A, Sterling.....℔ doz. $25.00
Model B, Sterling, Nickeled.....℔ doz. $23.00
Model B, Sterling, Japanned.....℔ doz. $21.00
Model C, Sterling.....℔ doz. $21.50
Model D, Sterling.....℔ doz. $19.50

Tacks, Finishing Nails, &c.

New List, May 1, 1905.
American Carpet Tacks..90&37½%
American Cut Tacks....90&37½%
Needes Cut Tacks.....90&37½%
Needes Upholsterers' Tacks... 90&50%
Gimp Tacks.....90&50%
Lace Tacks.....90&50%
Trimmers' Tacks.....90&37½%
Looking Glass Tacks.....65%
Bill Posters' and Railroad Tacks, 90&50%
Hungarian Nails.....85%
Finishing Nails.....70%
Trunk and Clout Nails....80&65%

NOTE.—The above prices are for Standard Weights. An extra 5% is given on Medium Weights, and an extra 10&5% is given on light weights.

Miscellaneous—

Double Pointed Tacks..... 90&66 or 7 tens
Steel Wire Brads, R. & E. Mfg. Co.'s list .....50&10@60%
See also Nails, Wire.

Tanks, Oil—

Each.
Emerald, S., S. & Co.....30-gal. $3.40
Emerald, S., S. & Co.....40-gal. $4.25
Queen City, S., S. & Co....30-gal. $3.65
Queen City, S., S. & Co....40-gal. $4.50

Tapes, Measuring—

American Asses' Skin ..50@—%
Patent Leather.....25@30&5%
Steel .....33⅓ 1-3&5%
Chesterman's .....25@25&5%
Eddy Asses' Skin.....40&10@50%
Eddy Patent Leather.....25@30&5%
Eddy Steel.....40@40&10%
Keuffel & Esser Co.:
Favorite, Ass Skin.....40&10@50%
Favorite, Duck and Leather..... 25&5@25&10%
Metallic and Steel, lower list..... 35@35&5%
Pocket .....35@35&5%
Lufkin's:
Asses' Skin.....40&10@50%
Metallic .....30@30&5%
Patent Bend, Leather....25&5@25&10%
Pocket .....40@40&5%
Steel .....33⅓@35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger... per 100 lbs. $3.00

Thermometers—

Tin Case.....80&10@80&10&5%

Ties, Bale—Steel Wire—

Single Loop.....80&2½%
Monitor, Cross Head, &c....70%

Brick Ties—

Niagara Brick Ties.....25&10%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tips, Safety Pole—

Covert's Saddlery Works.....60&10%

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White.....20@20&5%

Hay—

Myers' Hay Tools.....50%
Stowell's Hay Carriers.....50%
Stowell's Hay Forks.....50%
Stowell's Fork Pulleys.....50%

Miniature—

Smith & Hemenway Co.'s.....25%

Saw—

Atkins' Cross Cut Saw Tools.....40%
Simonds' Improved.....33⅓%
Simonds' Crescent.....25%

Ship—

L. & I. J. White.....25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro.....$11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida...75&5@75&10%
Newhouse .....40@40&5%
Hawley & Norton.....65%
Victor .....70&10%
Oneida Community Jump.....50%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 8½@9¢
Mouse, Round or Square Wire, doz. 85@90¢
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, each $1.21; ℔ doz. $13.25
No. 3, Rat, ℔ doz. $6.50; case of 50 $5.75 doz.
No. 3½, Rat, ℔ doz. $5.25; case of 72 ℔ gro. $4.70 doz.
No. 4, Mouse, ℔ doz. $3.85; case of 150 $3.00 doz.
No. 5, Mouse, ℔ doz. $3.00; case of 150 $2.25 doz.

Trimmers, Spoke—

Wood's E I.....50%

Trowels—

Disston Brick and Pointing.....30%
Disston Plastering.....25%
Disston "Standard Brand" and Garden Trowels.....35%
Kohler's Steel Garden Trowels, 5 in. ℔ gro. $4.80
Kohler's Steel Garden Trowels, 6 in. ℔ gro. $6.00
Never-Break Steel Garden Trowels.. ℔ gro. $6.00
Rose Brick and Plastering.....25&5%
Woodrough & McParlin, Plastering.25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern.....50&10%
Western Pattern.....60&10%
Handy Trucks.....℔ doz. $16.00
Grocery .....℔ doz. $15.00
Daisy Stove Trucks, Improved Pattern .....℔ doz. $18.50
McKinney Trucks.....each $10.00
Model Stove Trucks.....℔ doz. $18.50

Tubs, Wash—

No.	*1*	*2*	*3*
Galvanized, per doz.	*$4.25*	*4.75*	*5.25*

Galvanized Wash Tubs (S., S. & Co.):

No.	1	2	3	10	20	30
Per doz., net.	$5.70	6.30	7.20	6.60	7.20	8.10

Twine, Miscellaneous—

Flax Twine:	*BC.*	*B.*
No. 9, ¼ and ½-lb. Balls.	*22@24¢*	
No. 12, ¼ and ½-lb. Balls.	*18@20¢*	
No. 18, ¼ and ½-lb. Balls.	*16@18¢*	
No. 24, ¼ and ½-lb. Balls.	*16@18¢*	
No. 36, ¼ and ½-lb. Balls.	*15@17¢*	
Chalk Line, Cotton Balls	*½-lb. 25@30¢*	

Cotton Mops, 6, 9, 12 and 15 lb. to doz.....10@18¢
Cotton Wrapping, 5 Balls to lb., acording to quality...11½@20¢
American 2-Ply Hemp, ¼ and ½-lb. Balls.....13@14¢
American 3-Ply Hemp, 1-lb. Balls .....13@14¢
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine).....9½¢
India 3-Ply Hemp, 1-lb. Balls..9½¢
India 3-Ply Hemp, 1¼-lb. Balls. 7@8¢
2, 3, 4 and 5-Ply Jute, ½-lb. Balls .....9@10¢
Mason Line, Linen, ½-lb. Bls..46¢
No. 26½ Mattress, ¼ and ½-lb. Balls .....57¢
Wool, 3 to 6 ply....B 5½¢; A 6¢

Vises—

Solid Box.....60%

Parallel—

Athol Machine Co.:
Simpson's Adjustable.....40%
Standard 40%
Amateur 25%
Columbian Hdw. Co.....40%
Emmert Universal:
Pattern Makers' No. 1, $15.00; No. 2, $12.50.
Machinist and Tool Makers' No. 4A, $12.50; No. 5A, $7.00; No. 6A, $10.00; No. 10A, $22.50.
Presto Quick Acting.....25@25&5%
Tiger Machinists'.....40%
Fisher & Norris Double Screw..15&10%
Hollands':
Machinists' .....40@40&5%
Keystone .....65&5&2@70%
Lewis Tool Co.:
Adjustable Jaw.....30%
Monarch 50%
Solid Jaw.....50%
Merrill's 20%
Millers Falls.....60&10%
Massey Vise Co.:
Clincher 40%
Perfect 20%
Lightning Grip.....20%
Parker's:
Victor .....20@25%
Regulars .....20@25%
Vulcan's .....40@45%
Combination Pipe.....55@60%
Prentiss .....20@25%
Sargent's 40%
Snediker's X. L.....33⅓%
Stephens' 33⅓%
Williamson Mfg Co, Double Swivel.. 40&5%

Saw Filers—

Disston's D 3 Clamp and Guide, ℔ doz. $30.....25%
Perfection Saw Clamps, ℔ doz....$4.50
Reading 60%
Wentworth's Rubber Jaw, Nos. 1 2 and 3.....45&50%

Wood Workers—

Massey Vise Co.:
Lightning Grip.....15%
Perfect 15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Bignall & Keeler Combination Pipe Vise .....60&10%
Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe.....40%
Parker's Combination Pipe:
87 Series.....60%
187 Series.....60&5%
No. 870.....40%
Williamson Mfg. Co, Double Swivel Combination Pipe.....40&5%

Wads—*Price per M.*

B. E., 11 up	*60¢*
B. E., 9 and 10	*70¢*
B. E., 8	*80¢*
B. E., 7	*80¢*
P. E., 11 up	*$1.00*
P. E., 9 and 10	*1.25*
P. E., 8	*1.50*
P. E., 7	*1.50*

Dis. 15%

Ely's B. E., 11 and larger..$1.70@1.75
Ely's P. E., 12 to 20....$3.00@3.25

Ware, Hollow—

Cast Iron, Hollow—

Stove Hollow Ware:
Enameled 55%
Ground 60%
Plain or Unground.....65%
Country Hollow Ware, per 100 lbs. $2.75
White Enameled Ware:
Maslin Kettles.....70%
Covered Wares
Tinned and Turned.....40%
Enameled 50%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware.....60%
Iron Clad Ware.....70&10%
Lava, Enameled.....40&10%
Never Break Enameled.....50%

Tea Kettles—

Galvanized Tea Kettles:

Inch	*6*	*7*	*8*	*9*
Each	*45¢*	*50¢*	*55¢*	*65¢*

Steel Hollow Ware—

Avery Spiders and Griddles..65@65&5%
Avery Kettles.....60%
Porcelained .....50&5@50&10%
Never Break Spiders and Griddles.. 65&5%
Never Break Kettles.....60%
Solid Steel Spiders and Griddles.65&5%
Solid Steel Kettles.....60%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

Solid Zinc: ℔ doz.
Crescent, family size, bent frame.$3.25
Red Star, family size, stationary protector $3.25
Double Zinc Surface:
Saginaw Globe, family size, stationary protector.....$2.90
Cable Cross, family size, stationary protector.....$3.15
Single Zinc Surface:
Naiad, family size, open back, perforated $2.65
Saginaw Globe, protector, family size, ventilated back.....$2.50
Brass Surface:
Brass King, Single Surface, open back $3.25
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.25
Glass Surface:
Glass King, Single Surface, open back $3.25
Enamel Surface:
Enamel King, Single Surface, ventilated back.....$3.25

Washers—Leather, Axle—

Solid .....80&10@80&10&10%
Patent .....90@90&5%
Coil: ⅞ 1 1⅛ 1¼ Inch. 10¢ 11¢ 12¢ 13¢ per box

Iron or Steel—

Size bolt.... 5-16 ⅜ ½ ⅝ ¾
Washers ...$5.20 4.30 3.00 2.80 2.60
In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots..... per lb. 1¾@2¢

Weather Strip—

Flexible Felt—

Lined, per 100 ft., $2; $3; $4.....40&10%
Moore's Unlined, per 100 ft., $2; $3; $4 .....50&10%

Wedges—

Oil Finish.....lb. 2.25@2.50¢

Weights—Hitching—

Covert Mfg. Co.....40&2%
Covert's Saddlery Works.....60&10%

Sash—

Per ton, f.o.b. factory:
Eastern District...$27.50@$28.00
Southern Territory.$20.00@$23.00
Western and Central Districts .....$23.00@$25.00

Wire and Wire Goods—

Bright and Annealed:
6 to 9.....80&5@80&7½%
10 to 18.....80@80&5%
19 to 26.....80&10@80&10&5%
27 to 36.....80&5@80&10%
Galvanized:
6 to 9.....77½@77½&5%
10 to 14.....72½@72½&5%
15 to 16.....75&7½@75&10&2½%
19 to 26.....75&5@75&10%
27 to 36.....72½&5@72&7½%
Coppered:
6 to 9.....77½@77½&5%
10 to 14.....77½@77½&7½%
15 to 18.....75&10@75&10&2½%
19 to 26.....75&10&5@80%
27 to 36.....75@75&5%
Tinned:
6 to 14.....77½@77½&7½%
15 to 18.....75&5@75&10%
Annealed, Steel and Tinned, on Spools ..70&10&10@70&10&10&10%
Brass and Copper on Spools... 60&5@60&10&5%
Brass, list Feb. 26, '96.....20%
Copper, list Feb. 26, '96.....25%
Cast Steel Wire.....50%
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

List June 24, 1903.....90&40%

Wire Cloth and Netting—

Galvanized Wire Netting..... 80&15@80&17½%
Painted Screen Cloth, 100 ft., $1.20
Standard Galv. Hardware Grade:
Nos. 2, 2½ & 3 Mesh, sq. ft. 3 ¢
Nos. 4 and 5 Mesh, sq. ft..3¼ ¢
No. 6 Mesh, sq. ft.....3½ ¢
No. 8 Mesh, sq. ft.....4 ¢

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural ....75&10@75&10&10%
Alligator or Crocodile..70&10@75%
Baxter Pattern S Wrenches... 70&5@70&10%
Drop Forged S.....45@45&5%
Acme .....60&10%
Alligator Pattern.....70%
Bull Dog.....70%
Bemis & Call's:
Adjustable S.....40%
Adjustable S Pipe.....40%
Bemis Pipe.....60%
Briggs Pattern.....40%
Combination Black.....40&5%
Combination Bright.....40%
Merrick Pattern.....50%
Boardman's 40%
Coes' Genuine Knife Hdl..40&10&5&5%
Coes' Genuine Steel Hdl..40&10&5&5%
Coes' Genuine Key Model..40&10&5&5%
Coes', Genuine Hammer Handle..... 40&10&5&5%
Coes' "Mechanics'"...40&10&10&5&5%
Donohue's Engineer.....40&10%
Eagle .....50&10%
Elgin Wrenches, ℔ doz.....$6.25
Elgin Rethreading Attachment, one die, ℔ doz.....$6.25
Elgin Extra Dies, ℔ doz.....$3.00
Elgin Extra Jaws, ℔ doz.....$1.75
Elgin Monkey Wrench Pipe Jaws, ℔ doz.....$2.10
Gem Pocket.....30%
Hercules 70%
W & B. Machinist:
Case lots.....50&5%
Less than case lots.....50%
Improved Pipe (W. & B.).....60%
Solid Handles, P., S. & W...50&10@60
Stillson 65%
Vulcan Chain.....50%

Fruit Jar—

Triumph Fruit Jar Wrench, 5 gross lots, ℔ gross, $7.50; ℔ doz.....$0.80

Wringers—

Tuttle Roller Press Mop Pail Wringer, each, $8.00; ℔ doz.....$18.00

Wrought Goods—

Staples, Hooks, &c., list March 17, '92.....90@90&10%

Yokes, Neck—

Covert Saddlery Works, Trimmed..70%
Covert Saddlery Works, Neck Yoke Centers 70%

Yokes, Ox, and Ox Bows—

Fort Madison's Farmers' & Freighters'.....list net

Zinc—

Sheet.....per 100 lbs., $7.75@8.00

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:	
1 to 1⅞ in. round and square	₩ ₤ 2.05¢
1½ to 4 in. x ⅜ to 1 in.	₩ ₤ 2.05¢
1½ to 4 in. x ¼ to 5-16	₩ ₤ 2.25¢
Rods—⅝ and 11-16 round and square	₩ ₤ 2.25¢
Angles:	Cts ₩ ₤
3 in. x ¼ in. and larger	2.55¢
3 in. x 5-16 in. and ⅛ in.	2.50¢
1½ to 2½ in. x ¼ in.	2.25¢
1½ to 2¾ in. x 3-16 in. and thicker	2.20¢
1 to 1¼ in. x 3-16 in.	2.25¢
1 to 1¼ x ⅛ in.	2.30¢
⅞ x ⅛ in.	2.45¢
¾ x ⅛ in.	2.55¢
⅝ x ⅛ in.	3.60¢
½ x 3-32 in.	4.10¢
Tees:	
1 in.	2.55¢
1¼ in.	2.35¢
1½ to 2½ in.	2.35¢
3 in. and larger	2.70¢
Beams	2.50¢
Channels, 3 in. and larger	2.50¢
Bands—1½ to 6 x 3-16 to No. 8	2.30¢
"Burden's Best" Iron, base price	3.05¢
Burden's "H. B. & S." Iron, base price	2.85¢
"Ulster"	3.10¢
Norway Bars	3.30¢
Norway Shapes	3.80¢

Merchant Steel from Store—

	per ₤
Bessemer Machinery	1.95¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

Black.

	One Pass, C.R. Soft Steel.	R. G. Cleaned.
No. 14	₩ ₤ 2.50	2.60¢
Nos. 18 to 21	₩ ₤ 2.65	2.80¢
No. 27	₩ ₤ 2.80	3.10¢
No. 28	₩ ₤ 2.90	3.20¢

Russia, Planished, &c.

Genuine Russia, according to assortment	₩ ₤ 11¾@14¢
Patent Planished	₩ ₤ A, 10¢; B, 9¢, net.

Galvanized.

Nos. 14 to 16	₩ ₤, 2.85¢
Nos. 22 to 24	₩ ₤, 2.95¢
No. 27	₩ ₤, 3.70¢
No. 28	₩ ₤, 3.95¢

No. 20 and lighter 36 inches wide, 25¢ higher.

METALS—

Tin—

Straits Pig	₩ ₤ 33¼@33⅜¢

Tin Plates—

American Charcoal Plates (per box.)

A.A.A. Charcoal:	
IC, 14 x 20	$5.80
IX, 14 x 20	7.05
A. Charcoal:	
IC, 14 x 20	$5.65
IX, 14 x 20	6.15

American Coke Plates—Bessemer-

IC, 14 x 20 ..108 ₤	$4.15
IX, 14 x 20	5.15

American Terne Plates—

IC, 20 x 28	$8.20
IX, 20 x 28	10.20

Copper—

Lake Ingot	₩ ₤ 17 @17¼¢
Casting	₩ ₤ 16½@16¾¢
Sheet Copper Hot Rolled, 16 oz.	₩ ₤ 21¢
" " 14 "	" " 22¢

Sheet Copper Cold Rolled, 1¢ ₩ ₤ advance over Hot Rolled.
Sheet Copper Polished 20 in. wide and under, 1¢ advance over Cold Rolled.
Sheet Copper Polished over 20 in. wide, 2¢ advance over Cold Rolled.
Bottoms, Pits and Flats ₩ ₤ 25¢ basis
Planished Copper, 1¢ ₩ ₤ more than Polished.

Seamless Brass Tubes—

Stubs' W. G.	Outside Diameter. ¼	5-16	⅜	7-16	½	9-16	⅝	¾	⅞	1	Net. 1¼	1½	Base Price 20¢
4-11	..	....	..	....	..	....	..	..	..	..	20	20	
12	..	....	..	....	..	....	26	26	25	25	20	20	
13	..	....	..	....	..	....	27	27	25	25	20	20	
14	..	....	..	....	27	27	27	25	25	25	21	21	
15	..	....	..	28	27	27	27	25	25	25	21	21	
16	..	....	28	28	27	27	27	25	25	25	22	22	
17	..	31	28	28	27	27	27	25	25	25	23	23	
18	31	33	29	29	28	28	28	26	26	26	24	24	
19	33	33	29	29	28	28	28	26	26	26	25	25	
20	33	33	29	29	28	28	28	26	26	26	26	26	
21	44	49	31	30	30	28	27	27	27	27	27	27	
22	49	54	33	33	31	31	30	28	28	28	28	28	
23	74	59	35	35	33	33	31	31	31	31	31	31	
24	79	64	51	46	44	43	42	41	39	38	38	39	
25	84	69	54	49	47	45	44	43	42	42	43	44	

Iron Pipe Sizes—Brass

⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6 inch
28	27	22	21	20	20	20	20	20	20	20	21	22	24	26	27¢ ₩ ₤

Brazed Brass Tubing.

Discount from List June 6, 1898, 33⅓%.
Bronze and Copper Tubing advance on Brass List 3¢

Roll and Sheet Brass—

Discount from List June 6, 1898, 25%.

Spelter—

Western ₩ ₤ 6¼ @ 6⅜¢

Zinc.

No. 9, base, casks, ₩ ₤ 8.00¢ | Open ₩ ₤ 8.50¢

Lead.

American Pig	₩ ₤ 5.55@5.65¢
Bar	₩ ₤ 6.15@6.25¢

Old Lead in exchange, 4¢ ₩ ₤

Solder.

½ & ½, guaranteed	₩ ₤ 21 @21½¢
No. 1	₩ ₤ 19¼@19⅝¢
Refined	17½@18

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson	₩ ₤ 14 ¢
U. S.	13 ¢
Hungarian and Japanese	12 ¢

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting:

Small lots	₩ ₤ 37¢
100-₤ lots	₩ ₤ 35¢

Old Metals.

Dealers' Purchasing Prices Paid in New York.

Heavy Copper	₩ ₤ 14 ¢
Light and Tinned Copper	₩ ₤ 13 ¢
Heavy Brass	₩ ₤ 9 ¢
Light Brass	₩ ₤ 8 ¢
Lead	₩ ₤ 4.50 ¢
Tea Lead	₩ ₤ 4.25 ¢
Zinc	₩ ₤ 4.25 ¢
No. 1 Pewter	₩ ₤ 21 ¢
No. 2 Pewter	₩ ₤ 8 ¢
Pure Aluminum, Sheet	₩ ₤ 21 ¢
No. 1 Yard Wrought	$17.00@18.00
Wrought Pipe	$14.50@15.00
No. 1 Machinery Cast	$13.50@14.50
Stove Plate	$10.50@11.50

THE IRON AGE

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